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REPORT ON HEVEA BRASILIENSIS IN THE MALAY PENINSULA.

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(*Continued from page* 515.)

AREA *of trunk to be tapped* —The latex is present in all parts of the tree, but it is evident from the mere observation that when tapping the greatest yield is obtained from the base of the trunk, and experiments have been carried out with a view to determining the difference in yield at various heights of the trunk.

Table 1 shews the result of tapping five trees with **V**-shaped incisions, commencing at a height of 6 feet and working by stages of 6 inches towards the base. There were three incisions made on each tree at the same level and equi-distant apart.

TABLE I.

		ft.	in.			oz.		Av. per incision oz.
15	incisions at	5	0	from base	gave	1·50	dry rubber	·1
15	do	5	6		do	1·50	do	·1
15	do	5	0		do	1·75	do	·116
15	do	4	6		do	2·50	do	·166
51	do	4	0		do	4·75	do	·316
15	do	3	6		do	4·50	do	·3
15	do	3	0		do	5·25	do	·35
15	do	2	6		do	6·50	do	·433
15	do	2	0		do	7·00	do	·466
15	do	1	6		do	9 25	do	·616
15	do	1	0		do	11·25	do	·75
15	do		6		do	11·25	do	·75

It seemed probable, however, that the "wound effect" might account to some extent for the increased yield obtained from the lower part of the trunk; so his experiment was repeated on the same trees, this time commencing at the base and working upwards to a height of 6 feet. The result was:—

TABLE II.

		ft.	in.			oz.		Av. per incision oz.
15	incision at		6	from base	gave	12·50	dry rubber	·833
15	do	1	0		do	10·50	do	·7
15	do	1	6		do	9·50	do	·633
15	do	2	0		do	7 50	do	·5
15	do	2	6		do	5·50	do	·366
15	do	3	0		do	4·75	do	·366
15	do	3	6		do	4·25	do	·283
15	do	4	0		do	3·75	do	·25
15	do	4	6		do	4·00	do	·266
15	do	5	0		do	3 75	do	·25
15	do	5	6		do	3·00	do	·2
15	do	6	0		do	2·75	do	·183

It will be noticed that in this experiment the yield between 4 and 6 feet was nearly doubled; while the yield from the lower 4 feet of the trunk is about the same as was obtained in the previous experiment.

Taking the results of the two experiments together and stating the yield for three sections of the trunk, we have:—

				oz.		Av. per incision oz.
120	incisions	base to 2 ft. up	gave	78·75	of dry rubber	·65
120	do	2 to 4 ,,	do	39·25	do	·32
120	do	4 to 6 ,,	do	20·75	do	·17

This experiment shews very clearly what part of the trunk contains the largest amount of latex and demonstrates the necessity of confining the attention as much as possible to the first four feet from the base.

Other experiments with similar objects in view were conducted on trees tapped on the herring-bone system: the result of tapping five trees, 3 to 6 feet up the trunk, being shewn in Table III.

In each case the oblique incisions, were 1 foot long and 1 foot apart, there being six such incisions, three on each side of the vertical channel, which was 3 feet long, the wounds being renewed on 14 consecutive days.

TABLE III.

5 trees tapped every (14 days) from 3 to 6 feet up.

Total weight of wet rubber 130⅛ ounces. Average per tree 26·02 ounces.

Table IV shews the yield from the same trees tapped in precisely the same manner, but ranging from the base of the tree to a height of 3 feet.

TABLE IV.

Tapped every day, base 3 feet up.

Total weight of wet rubber 173⅞ ounces. Average per tree 34·77 ounces.

A noticeable point about this experiment is that trees Nos. 7, 8 and 14 gave a better return when tapped from 3 to 6 feet high than when tapped from the base to a height of 3 feet; in fact Nos. 7 and 8 failed to yield at the base after being tapped on 12 occasions or after the whole tree had been tapped 26 times. The inference to be drawn is, that as the experiment was conducted first on the high area, that the latex obtained was in part drawn from the lower portion of the trunk.

I might here incidentally mention that these are the only trees I have succeeded in "draining," and that they look none the worse for it, but after a lapse of 12 months are bearing seeds freely.

The increase in yield at the base of tree No. 19 is very marked, being nearly three times the amount obtained at the higher area, and suggests a more complete communicative system in the lower regions of the trunk.

On the occasion of my next visit to S'tiawar, another experiment was made on the same lines, this time the lower area being operated on first. The trees utilized were of the same age and dimensions as in the previous experiment and care was taken that the incisions, which were renewed on 14 occasions, were of the same length and distance apart.

The result of this experiment is shewn in Table V and VI.

TABLE V.

Tapped every day at base 3 feet up.

Total weight of wet rubber 221¾ ounces. Average per tree 44·35 ounces.

TABLE VI.

Tapped every day, 3 to 6 feet up.

Total weight of wet rubber 195½ ounces. Average per tree 39·10 ounces.

In this case trees Nos. 13 and 26 gave a larger return when tapped at a height of 3 to 6 feet, which is significant considering that in the case of tree No. 26 over 2½ pounds of wet rubber had previously been extracted from the lower three feet of the trunk.

Adding the results of these two experiments together we have :—

140 incisions on 10 trees,	base 3 feet,	gave	395⅝	ounces of wet rubber
140 ,,	3 to 6 feet,		325⅝	,,
	By difference		70	,,

The result then is an average of just 7 ounces of wet rubber per tree in favour of the lower three feet of the trunk.

Judging from the results of these experiments I am led to believe that although it appears, at least in some cases, that the latex obtained is drawn from the whole of the laticiferous system, that this is only true to a small extent; otherwise, I fancy the disparity in yield between trees tapped first at the base and afterwards higher up the trunk, or *vice versa*, trees tapped at a height of 3 to 6 feet up the trunk and afterwards at the base, would be much more marked.

This gives rise to the question as to whether it is possible to obtain a maximum yield by confining the operations to any one particular area, having regard to the labour entailed and the injury inflicted on the tree. A glance at the foregoing tables will shew that this does not appear to be the case, for it will be seen that although in one experiment 221¾ ounces of wet rubber were obtained from five trees when tapped within 3 feet of the base, there still remained 195½ ounces which were obtained immediately afterwards by tapping the tree higher up the trunk. But it will also be noticed that in the majority of cases there was no indication of a cessation of flow of latex when the operations were suspended, and it seems quite probable that the whole of this latex might have been obtained by confining the incisions to one of the two areas. This, however, would have necessitated the renewing of the incision on at least 28 occasions, probably more and the result would have been a huge wound, and the life of the tree would have been endangered thereby.

It is inadvisable, as already stated, to make the incisions of an undue length, while if the oblique incisions are placed more than 1 foot apart, the result is a long vertical channel, in which a large amount of latex will coagulate before reaching the tin; so that the method which suggests itself as being expedient is that of making V incisions or small herringbone incisions on various parts of the trunk not exceeding a height of 6 feet.

Unfortunately, experiments in this direction are far from complete owing to the lack of trees of a suitable age, but I append the result of tapping five nine year old trees with V incisions, and the result of an experiment on the same trees, 12 months later, with small herring bone incisions. In the first experiment the two lines forming the V were 6 inches long in each case. There were five incisions made on each tree, ranging from the base to a height of 6 feet, each side of the trunk being utilized, so that in an oblique direction the wounds were about 2 feet apart. The latex was collected separately from each wound, which was renewed on 12 occasions at intervals of two days. The result is shewn in Table VII.

TABLE VII.

Average yield of wet rubber 46·2 ounces. Average yield per tree of dry rubber (including scrap) 28¼ ounces.

A noticeable feature in this table is the yield of tree No. 41 which averaged over six ounces of wet rubber each day the incision was renewed: it will also be noticed that the total yield on the last day was in excess of that obtained on any previous occasion.

The following year the same trees were tapped with small herring-bone incisions. There were three incisions on each tree, the vertical channel being 1 foot long, and the "feeders," two on the left of the vertical channel and one on the right, situated midway between the other two, were 8 inches long 1 foot apart. The incisions were renewed on eight consecutive days, but the latex being required for experimental purposes the weight *per tree* cannot be given. The weight *per day* and the *average* weight per tree of dry rubber obtained is shewn in Table VIII.

TABLE VIII.

TEN YEAR OLD TREES.

Trees No. 41, 42, 43, 44, 45. Tapped by small herring-bone incisions on eight consecutive days.

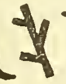
1st day	.. 7½	ounces dry rubber	including scrap
2nd ,,	.. 8½	,,	,,
3rd ,,	... 11½	,,	,,
4th ,,	... 13¼	,,	,,
5th ,,	.. 11¼	,,	,,
6th ,,	.. 13¼	,,	,,
7th ,,	... 14¾	,,	,,
8th ,,	... 15	,,	,,

Total weight...95½ ounces.

Average weight of dry rubber per tree 19·1 ounces.

Had the incisions in this instance been renewed on 12 occasions, as was the case in the former experiment the yield would almost certainly have exceeded that obtained by tapping with V incisions. As it is, a comparison between the two systems shews that the

first eight renewals of the **V** incisions gave 131½ ounces of *wet* rubber, as against 95½ ounces of *dry* rubber when tapped with small herring-bone incisions. Assuming that the loss on drying was 50 per cent and counting "renewals" as 'incisions' the figures read :—

	ounces	ounces
200 (**V**) incisions gave	131½ wet rubber=	65·75 dry rubber
120 ()		95 50

As there were five **V** incisions on each tree, and the two lines forming the **V** were each 6 inches long, the exposed surface totalled up to 5 feet per tree. When the same trees were tapped with small herring-bone incisions, the total length of the incisions was 6 feet, regardless of the central channel which was not opened after the first day; so that although the length of incisions in the latter case only exceeded those of the the former by one-fifth, the yield increased by one-third. The fact that the trees were twelve months older at the time they were tapped with herring-bone incisions, probably accounts to some extent for the extra yield obtained when tapped by the latter method.

When compared with the yield from those trees tapped by herring-bone incisions, confined to the lower 3 feet of the trunk this system may be considered very successful. The total length of the incisions was the same in each experiment, *viz.*, 6 feet, but if the yield for the first eight days of the trees enumerated in Table V be totalled up, we shall find that 30 feet of incisions (made on five trees and renewed on eight occasions) gave 105½ ounces of wet rubber (say 52 ounces dry as against 95½ ounces of dry rubber obtained from 30 feet of incisions (on five trees and renewed on eight occasions) made on various parts of the trunk. In short, nearly twice the amount of rubber was obtained from the same length of incisions, when the whole area of the trunk was operated upon, and the cost of extraction therefore reduced by about one-half. This, however, is only the result of a single experiment and the results cannot by any means be considered conclusive. So far as they go they strenthen the supposition that if a maximum yield is to be obtained at a minimum cost, which—assuming the operations are always conducted in the same careful manner—is paramount to a maximum yield with a minimum injury to the tree, tapping must not be confined to any particular area. Other experiments in this direction are in progress and the results will be made known from time to time. One point which has not yet been noticed, is the rapidity with which the wounds heal, when made a considerable distance apart.

(*d*). *Length and distance between the incisions.*—The length of the vertical channel in some of the experiments already alluded to, was 3 feet but incisions of this length are not recomended, the objection being that part of the latex coagulates before reaching the tin, especially in hot dry weather. The length of the "feeders" will depend upon the girth of the tree, but for the same reason it is inadvisable to make them more than 1 foot long even on the largest trees.

When taping young trees, they should be shorter in proportion to the circumference of the trunk, so as to avoid any risk of checking the growth of the tree by preventing a free passage, for the conveyance of the crude sap absorbed by the roots, to the green parts of the plant, there to be elaborated into starch and other organic compounds which supply the essential constituents for the formation of new structures and replace the material consumed during the growth of the plant.

It may be taken for granted, that in a given area, the greater the number of incisions the greater the yield; also that if the same number of incisions be made over an area, say twice the size, the yield would be considerably more; but I do not hold, however, even assuming this to be the case, that it is expedient to make the incisions closer than 1 foot apart, as the extra yield obtained is not in proportion to the extra labour entailed; while on the other hand if the oblique incisions are made more than this distance apart, the result will be a vertical channel of an undesirable length. Further, cicatrization of the wounds is considerably delayed, if the incisions are made too close together, as the amount of growing tissue in their immediate vicinity is necessarily limited.

(2). *The effect of wounding on the flow of latex.*—Perhaps the most important point of all to be considered, is that of taking full advantage of what has previously been alluded to as "wound effect." This phenomenon, which appears to be well known to the natives of Brazil, was first scientifically observed by Mr. J. C. Willis, Director of the Peradeniya Gardens, and is mentioned in a circular issued by the Ceylon Botanical Department*: the result of a series of experiments on the effect of wounding on the flow of latex by Mr. Parkins, being set forth in a later circular, issued by the same Department † and to which I am indebted for many valuable suggestions.

The function of the latex is not yet properly understood, but it is quite distinct from the sap, occuring in comparatively few plants and is probably unessential to the life of the tree. The effect of wounding the tree appears to cause an increased flow of latex towards the injured part, for if the wound be re-opened on the following day, the yield is nearly always found to be considerably in excess of that obtained on the occasion of the original tapping, sometimes three or four times as much. Also, if the wound is opened again on the third day, the yield is found to exceed that of the second, and generally the yield of the fourth day exceeds that of the third and so on.

(*a*). *The number of times the incisions* can be advantageously renewed.

Many experiments have been made with a view to determining the number of times it is advisable to-reopen the wound, but it was found that all trees were not affected in a similar manner, so that it is impossible to lay down any hard and fast rule; for although in some cases the maximum yield has been obtained on the fourth day, in others it was not reached until the fourteenth tapping.

Generally, however, the flow shews a marked increase between the first and second tapping, then a steady increase until the fifth or sixth tapping is reached, afterwards remaining more or less stationary until the operations ceased; in the large majority of cases there were no signs of falling off, even after the incisions had been renewed a dozen times, but by his time the wound had of course become very large and it was deemed advisable to stop operations.

Below I have summarised the results of several experiments, made with a view to ascertaining the number of times the incisions should be renewed. The trees experimented upon were tapped on the herring-bone system, previously described, and the incisions renewed by taking off a very thin layer from each side of the wound with a sharp knife on 14 occasions.

* Royal Botanic Gardens, Ceylon. Series 1—No. 4.

† do do do —No. 12, 13. 14

The result was as follows:—

TABLE IX.

Shewing result of "wound-effect" on 30 trees tapped on 14 occasions.

30 trees.	1st tapping gave 10 oz. dry rubber.		Average per incision	·33 oz.
do	2nd	16½	do	·55 ,,
do	3rd	26	do	·86 ,,
do	4th	28½	do	·95 ,,
do	5th	36	do	1·2 ,,
do	6th	39¾	do	1.32 ,,
do	7th	37¼	do	1·24 ,,
do	8th	40½	do	1·35 ,,
do	9th	39¾	do	1·32 ,,
do	10th	45½	do	1·51 ,,
do	11th	43¼	do	1 45 ,,
do	12th	48	do	1·6 ,,
do	13th	47½	do	1·50 ,,
do	14th	47½	do	1·58 ,,

It will be seen from the above table that there was a steady increase in the flow of latex until the tenth renewal, and that from then until the operation ceased the yield each day was greater than had been obtained on any previous occasion. It should be mentioned, however, that this was only the case in a few trees, which gave a considerably increased yield on the last four occasions, and that in the majority of cases the yield from the tenth to fourteenth day was about the same as that obtained between the sixth and tenth day.

The difference in yield between the first and second occasion does not stand out so prominently in the Table as it should. This is due to the fact that some of the trees had recently been experimented upon (for owing to lack of material some trees had to suffice for several experiments) so that what is termed a "first tapping" when made on the opposite side of a tree recently tapped, has often given a much larger return than a "first-tapping" made on a hitherto untapped tree.

This, then, all goes to prove what was stated previously, that all trees are not affected to the same degree, and that if advantage is to be taken of the "wound-effect," the incision must be renewed at least eight times. It might, of course, be renewed oftener but the result would be an ugly wound, pre-disposing the tree to disease, and cannot therefore be recommended.

(*b*). *The length of time that should* elapse before renewing the incisions.

Here there does not appear to be the same difference in the behaviour of trees in responding to the wound-effect, and it was generally found that an increased flow was obtainable after a lapse of twenty-four hours. With a view to determining whether any beneficial results followed by allowing the trees to "rest" for a few days before renewing the incisions, some trees were tapped every day, others every third day and others at weekly intervals.

The result of tapping 10 trees by herring-bone incisions on 14 consecutive days is shewn in the following Table.

TABLE X.

TAPPED EVERY DAY.

Total weight of wet rubber 351½ *ounces. Average yield per tree* 35·15 *ounces.*

Table XI shews the yield from 10 trees tapped on the same principle on 14 occasions at intervals of two days. Care was taken that the trees were of the same age and as nearly as possible of the same dimensions and that the incisions were exactly the same length and distance apart: each being measured and marked with pencil before the incision was actually made.

TABLE XI.

TAPPED EVERY THIRD DAY.

Total weight of wet rubber 374 *ounces. Average yield per tree* 37·4 *ounces*

It will be seen that the result is in favour of the trees tapped at intervals of two days to the extent of 22½ ounces of wet rubber, which is equal to about 1 ounce of dry rubber per tree.

The result of tapping 10 similar trees at weekly intervals is shewn in Table XII, the operations extending over a period of five weeks.

TABLE XII.

TAPPED EVERY WEEK.

Total weight of wet rubber 104¾ *ounces. Average yield per tree* 10·47 *ounces.*

Time did not permit of this experiment being carried on longer so it will be necessary to compare the results with those obtained on the first six occasions in Tables X and XI. These are as follows:—

60 incisions made on six consecutive days gave			99½ ounces wet rubber.
60 ,,	at intervals of two days	,,	111⅝
60 ,,	,, one week	,,	104¾

There does not appear therefore to be any great advantage by renewing the incisions at long intervals, and I am of opinion that the response to the wounding is generally, if not always, discernible after the lapse of a single day. Judging from the above figures this, at first sight, does not appear to be the case but a perusal of the foregoing tables will shew that the smaller amount obtained from the trees tapped daily, is mainly due to the inclusion in this experiment of tree No. 20, which gave less than one-fifth the amount obtained from tree No. 2, for no apparent reason. This disparity in the yield of trees growing under the same conditions, and tapped in precisely the same manner, is in some instances most marked and demonstrates the necessity of conducting experiments over a large number of trees, if definite conclusions are to be arrived at. A further experiment was made in this direction; the trees which had previously been tapped on six occasions at weekly intervals, were now tapped on six consecutive days on the opposite side of the trunk, the incisions being of the same length and distance apart as on the former occasions, the result being shewn in Table XIII.

(*To be concluded.*)

ORANGE CULTIVATION.

There are some orange groves planted here within the last four or five years in which we see illustrated almost every mistakes that is to be made in orange growing here, but which may not be mistakes elsewhere, that is, in more temperate lands, with less forcing soils and climate. The first, most common and most serious error is in the planting; the trees have been planted too deeply in the soil, the roots buried until the earth is packed two inches up the stem above the neck of the tree. This is an error in tree planting everywhere, and we have seen it made in the north in forestry in the setting out of firs and in horticulture in the setting out of orchards of fruit trees, and berry bushes. It is not fatal on light sandy soils, and the trees grow, fruit, and continue to give returns, but they never make a quick, large, or robust growth and are always much subject to the many troubles that affect plants. On heavy soils deep planting is fatal to profit. In our forcing climate and heavy rich soils, where weeds grow rapidly and luxuriously, and there is need of constant hoeing, trees are better planted even higher out of the soil than ever we had experience of before, because,—1st, on accounts of the heavy rains that beat upon the soil, and pack it tight, so that if the earth is packed high round the stems the roots are choked, whereas if the neck is clear of the earth with the top main roots running close to the surface, the water running down the stem, sinks in and follows the interstices, along the roots; thus air, moisture, and drainage pass continually through the soil to every root and rootlet; 2nd, to allow for the constant hoeing of weeds; in doing this there is a continual drawing away of soil along with the weeds,

which are heaped around the outside circle of the tree both actions combining to cause the tree more and more to stand in a hole; then the rains fall and drain off slowly, leaving the ground soggy and when some dry weather sets in, this soil becomes baked hard and sour; 3rd, to allow for the forking or ploughing around the trees, and the ploughing in of the weeds, consequently the raising of the soil. Take the level of a piece of uncultivated land, and when it has been ploughed up and harrowed smooth, take the level again, it will be found three or four inches higher than before. As it hardens it settles again about two inches in six months, only to be stirred up again by further cultivation, and probably the ploughing in of weeds raises it two or three inches further. Anyway the soil is further raised by cultivation, little, but appreciably enough to make a row of orange trees planted on a level with the surface of the field when uncultivated, appear by and by, after cultivation to stand in a hollow. Again after the planting out of a field with orange trees planted at first in holes, drainage is found to be necessary, the earth from the drains is of course flung up in a ridge or scattered around, and the water in heavy rains runs towards the orange trees, more than into the drains. We have done things too casually heretofore and looked at tree planting as if it was a thing that any unskilled person could do, and again, we have learned that the experience of agriculturists tutored in other lands where many of the conditions are diametrically opposed to here, is of little use unless it is adapted to the circumstances prevailing here. Long ago when a boy wandering in the woods, we noticed that the fir tree grown from a cone had the upper part of its top roots clear of the ground so that you barked them when you stepped roughly on them, the wild crab-apple grew the same way, so did every tree in nature grown from a seed, Here you can see the wild orange growing in the same fashion, see too the long holes of the cotton tree ending in roots running along the surface so that you trip over them. It is the nature of trees that are surface feeders to grow like this, and they send out many superficial roots spreading in a fibrous network all along close to the surface, and such trees can grow and thrive in poorer soils, by means of the abundance of their feeders, than trees that send out few roots. The latter are generally deep growers and send down a very long vigorous taproot, and when delicate, like cocoa require a deep, free, moist, rich soil to be at their best. Another error in orange growing is the indiscriminate use of the fork by those who have the mind to cultivate. Cultivation is recommendable, when judicious, the fork is a worthy implement, where there is a head as well as hands governing it. The late Secretary, Mr. George A Douet, had much to do with the bringing of the fork into general use to supersede the hoe in breaking the land we should like to see the rake in common use here, especially for the cultivation of fruit. We see horrible destruction of the feeding roots of orange trees by forking, and damage done that would kill fruit trees in places less richly endowed by nature in climate and soil. Trees over three years planted are hoed, then forked right up to the stem, so that you see big clods turned over matted with broken and wrenched up roots. If this is done in dryish weather, the hot air and wind penetrate right into the root system drying out the broken ends of roots so that if they ever form callus and send out rootlets at the break, it will be a slow business. Altogether, these trees would have been very much better off without such cultivation. Fruit trees grow best in a soft firm soil, and the roots should never be broken unless at the ends where they are growing out, and then the cut should be clean, as from clean cut ends more roots will start out quickly and in healthy condition, than from broken rough edges. Orange trees should be hoed around from the stem to a little further out than the sweep of the branches as it will be found that the roots go out further, often very much further. The hoeings after exposure to the sun and air to kill the weeds, should then in dry weather be raked back to the hoed surface and raked backwards and forwards until the surface is loose. The soil beneath is seldom other than moist in this country, and the raking so loosens the surface while the weedings form such a soft mulch, that the soil will not bake through three months of dry weather which does not often occur anywhere here. At other times when moist weather prevails and the earth is soft, the weedings instead of being piled around to tempt roots to creep up into them should be spaded in so that the ground where the roots will extend may at once be loosened and manured. An annual cultivation like this done in November after the heavy rains are over and the crop is off is most suitable for early bearing trees. The weeds will supply pretty much all the humus and nitrogen necessary, and an application of wood ashes at the same time will provide the necessary phosphoric acid and potash, so that the new roo lets may have abundance of food-material at hand. This slight root pruning done by careful spading at the outside terminus of the root system of fruit trees about November will at once send the sap back into the tree; blossoms will break out in January and by the time the bloom is set, the new roots will be vigorously feeding in the well prepared and fertilized soil, and ready to meet the greatest demands that the swelling fruits may make upon them. The applications of fertilizers may be made if desired when the fruit sets and again when it is nearly full. Forking in fruit groves should only be done to prepare land, and where there are no roots to be wrenched and torn. The rake and the spade are the implements where hand labour is to be used; the former to stir the surface soil beneath the trees, and give young weeds no rest, and the latter to turn over the soil outside the trees. Where horse labour is used, of course the sharp plough will do the cutting of the tips of the roots, and the harrow-toothed cultivator is the best implement for running close to the trees and stirring the soil. The spade and the rake or the plough and harrow cultivator, together with the hoe, which is indispensable for weeding; these are the implements for orange groves. These thoughts are the result of personal practice and wide but minute observation, and the recommendations made are meant to be, and of course, should be, accompanied by the keeping of the trees clean by spraying or washing if necessary, for orange growing in groves. It would be difficult to put such cultivation into practice on scattered pasture-grown trees, though it might pay to thoroughly cultivate these trees. Failing root cultivation, the washing being carried out as given in the report published below, should not fail to be done. Certainly, we were not prepared to believe that the mere cleaning and washing of branches and trunks as done in these experiments, without any cultivation of the trees standing in grass, could have been so quickly responded to in healthy leaf and blossom. But the results in fruiting will be the best test. Anyway, we welcome every idea and practice that will help to put our citrus trade on a better basis. It is pretty much casual and chance at present.—*The Journal of the Jamaica Agricultural Society.*

RECIPES FOR COOKING WEST INDIAN YAMS.

(*From Imperial Department of Agriculture for the West Indies*).

Yams require a deep, rich soil, and under favourabe conditions produce large crops. The following recipes for cooking and preparing yams are issued for distribution in the hope that if carefully carried out, those not already acquainted with this nutritious food may ensure that it is presented to them in an attractive and pleasant form.—D. Morris Commissioner of Agriculture for the West Indies, September 10, 1902.

The 'Yam' so familiar to all classes throughout the West Indies is practically unknown in Great

Britain. Beyond the comparatively small number of people who have visited the tropics few have definite knowledge as to the nature of the plant, or of the wholesome and palatable character of the food it provides.

Although grown throughout the tropics, it is in the West Indies that Yams are to be found at their best and in the greatest variety and abundance. During the time of the year they are in season they form a standard dish at the planter's table, in addition to being one of the staple foods of the estate labourer and, in fact, of all classes throughout the West Indies. The majority of visitors to the West Indies become even in the course of a brief stay, very partial to the yam.

For those who have not visited the tropics the general character of the yam plant may perhaps be best described by saying that it closely resembles in habit the black bryony of English hedgerows. The plants are near relatives and agree in their twining stems and shining heart-shaped leaves. Both, moreover, have and underground tuberous 'root,' but whilst that of the bryony is uneatable, the yam 'root' supplies man with one of the most wholesome vegetables the world affords.

The varieties of yams are legion. Some are distinguished by the names of places whence they were first obtained, others by descriptive names, such as 'horn yam,' 'snake yam' etc. Yams vary greatly in size and appearance. Usually they are covered by a deep brown skin, and their flesh is firm and of various shades of white, yellow, or in some few cases distinctly purple. Some are not more thau 6 inches long and one pound or so in weight, whilst other varieties measure 3 or 4 feet in length, 6 or 9 inches in diameter, and weigh 30, 40, 50, or even 100 pounds.

Their cultivation is comparatively simple. The upper portion of a yam called the 'yam head' is put in the ground. It produces fresh leafy shoots, and the new yams slowly form and mature beneath the ground. In Barbados the foliage is allowed to trial over the surface of the ground, whilst in Jamaica, Trinidad, etc., a stout stick is stuck in by each plant up which it climbs, so that a yam patch somewhat resembles a miniature hop field. The different varieties of yams take varying periods to come to maturity. Some kinds are ripe in five months, whilst others do not reach perfection for nine months or even a year.

The following hints prepared by Mrs. J. R. Bovell, are published for cooking yams and presenting them in an attractive form at table.

Roasted Yams.—lay a yam before the grates of the stove or in the oven, turning it occasionally until cooked. Scrape off the outer skin, cut into pieces or mash with butter and serve hot.

Baked Yams.—Pare a yam, put it in the oven and bake until soft, take it out of the skin, mash with butter, put back into skin, cut in pieces and serve hot.

Boiled Yams.—Pare a yam, put it into boiling water, cook until tender, serve whole.

Yam Chips.—Pare and boil a yam until tender. Cut in chips, fry in boiling lard and serve hot.

Yam Rice.—Pare and boil a yam until tender, press through a colander on to a hot dish, shake the oolander lightly every few seconds to cause the yam to fall off in short grains like rice and serve very hot.

Yam Rissoles.—Pare, boil and mash a yam, add pepper and salt and, if liked, a little minced parsley, Shape into rissoles, cover with egg and bread crumbs and fry until a light brown.

Yam Border.—Pare, boil and mash a fair-sized yam about two pounds in weight, add to it two tablespoonfuls butter, half a cup boiling milk, one tablespoonful salt, the yolks of two eggs well beaten; beat the mixture until very light. Butter a border mould, pack the yam in it and let it stand for eight minutes. Beat the whites of the eggs to a froth, add salt, turn out yam, cover with the whites and put in an oven to brown. Take from oven and fill the centre with meat or fresh fish heated in a sauce.

Yam *au Choux*.—One pound boiled yam, one boiled cabbage, two tablespoonfuls cream, one ounce butter, with salt and pepper to taste.

Rub the yam and cabbage through a wire sieve, mix together with butter, cream and seasoning. Pile upon a dish and serve with fried croutons of bread around. Serve very hot.

Porcupine Yam.—Two pounds yam, boil and mash with one egg and salt to taste. Shape and roll in beaten egg and vermicelli; fry. Serve hot with parsley.

Yam Fritters.—Pare and boil half a pound of yam until soft, beat lightly with a fork. Beat the yolks of four and the whites of three eggs, add two table spoonfuls of cream, two tablespoonfuls of wine, one dessertspoonful of lemon juice and half a teaspoonful grated nutmeg beat all altogether until extremely light. Put plenty of lard into a frying pan and drop a tablespoonful of the butter at a time into it, and fry the fritters a nice brown; serve with wine sauce served separately, or only sprinkle powdered sugar over them.

Yam Pudding.—Half a pound yam, two eggs, one lemon, two ounces butter two ounces sugar. Pare and boil the yam and rub it through a sieve while hot. Beet the butter and the yam together and allow the whole to cool. Break the eggs and separate the yolks, from the whites. Beat the yolks until light, add sugar juice of lemon the grated rind and the yam. Whisk the whites to a stiff froth and stir lightly in before baking. Put in a well buttered dish and bake in a brisk oven for twenty minutes.

Yams *en Brun*.—Cut up one pound of yam already boiled and fry a light brown, sprinkle thickly with chopped parsley and shalot or mushroom, pepper, sale and lime juice, and serve very hot.

BALATA GUM IN BRAZIL.

The United States Consul at Para states that attention has recently been directed to the possibilities of the balata fields on the Amazon. A gutta-percha merchant in the Guianas, examining this region about a year ago, found the balata tree growing in abundance near Para, and on the Amazon and its tributaries for thousands of miles. The Brazilians had no knowledge of its gum producing qualities. After persistent effort, he succeeded in interesting persons in the United States and Para, bought a concession, and has lately begun the practical work of producing gutta-percha for the market. As in the case of rubber there is practically no limit to the supply of gutta-percha on the Amazon, and as it can be produced at a fraction of the cost of rubber, it offers a much higher per centage of profit.

The Consul quotes the following report on this subject from Mr. William Gerdeau, who has had a practical experience of many years in the Guianas where he represented American and English gutta-percha importers and managed balata estates:—"Pursuant to your request I submit the following report of my personal investigations of the balata fields of Brazil during my recent explorations of this region: "The balata or bulle tree known in the Brazilian language as the macaranduba, grows in great abundance throughout the Amazon valley but up to this time no attempt has ever been made to introduce the gutta-percha trade in this country. "For more than 30 years this trade has been carried on with immensely profitable results in the Guianas and the Orinoco Valley, but those fields are now almost exhausted and very little gutta-percha has recently been shipped. "It is my opinion that this balata trade can be made to rival the rubber trade in this country, as it can be produced here in unlimited quantities and its quantity is if not better at least as good as the Guiana balata. "I have found the balata trees scattered and in groves, sometimes amounting to forests many miles in extent, all over the States of Para and Amazonas, and I am informed on trustworthy authority that vast

areas of these trees are growing on the Purus and Acre Rivers and other tributaries of the Upper Amazon River. "The method of bleeding the balata tree is entirely different from that used to extract the gum of the rubber tree, and only experienced and expert bleeders can be employed. But on the other hand, these trees yield many times as much sap as the rubber trees, and one man can easily produce as many kilograms of gutta-percha in a day as 20 men can extract of rubber. The trees will average 3½ lb. gutta-percha each, and a competent bleeder can prepare 40 to 50 lb. per day. The gum is first fermented and then dried in the sun, after which it is ready for shipment. "I am surprised to find that this valuable gum, which is so easy of access and so cheaply prepared for market has never become known to the trade here. Many great fortunes have been made in Guiana from this trade, and I believe the time is now ripe for capital to develop the trade here. I found the Brazilians cutting down these valuable trees for firewood and building material being ignorant of their true properties. "Concessions of balata fields of any extent can readily be secured from the Brazilian Government, and private balata lands can be purchased for a fair price. It only requires some capital and practical knowledge of the business to develop one of the greatest industries in Brazil."—*Board of Trade Journal.*

DIEBACK IN COCOA.

It is a very general belief that the alluvial soils along river banks form the very finest areas for the cultivation of cocoa. This is as a rule true, but there may be certain exceptions not generally taken into account, and the rule that wherever bananas grow very easily the same soil is good for cocoa is not an absolute rule at all. They require the same conditions of climate and soil, but cocoa requires more; it should have a deep soil. The banana is a surface feeder, and an alluvium three feet deep, provided there is gravel and free drainge below will suit excellently, whereas clay below does not suit it so well, necessitating elaborate drainage, while on the contrary cocoa does not so much mind a clay below so long as it is not sour but objects more to a gravel. There are somo sub-soil to loamy alluvium that are clays; the cocoa thrives there well; other subsoils are sand the cocoa does not object; others are gravels but with plenty of earth, that is a gravelly earth, the cocoa stands this but when there is a bed of pure gravel below, the taproot of the cocoa finds it objectionable, stops growing and dies back, when the top of the trees respond by dying back too. On inspecting a place whereon to grow cocoa, the sub-soil should be a subject of close examination. Another cause of dieback besides the existence of a coarse gravel below, is the too close proximity of vigorous growing bananas. Deep shade is beneficial to young cocoa, but when the plants are well established which is at a year old, it does not do to have them surrounded by dense walls of bananas with the soil crowded with their vigorous greedy roots. The young cocoa, with its taproot striking downward has not many superficial feeders like coffee or oranges, it cannot make a good fight for itself and is often starved. In old banana plantations where there is a large growth and cocoa is to be planted, it is a good plan to plant the cocoa in the line of the bananas and re-plant the bananas between the old rows when the cocoa is two years old. At any rate the cocoa must have light and air, but not direct sunshine above, and plenty of room without severe competition to feed on the soil below. When cocoa trees begin to die back, it often enables them to overcome their weakness by cutting back slightly, and fertilising. This encourages the making of more lateral roots which thus give larger feeding powers.—*Journal of the Jamaica Agricultural Society.*

THE GARDENERS WIL.

WAUKEN, my muse! yer loodest wail,
Lend to proclaim the waefu' tale,
O' a' the ills that do assail
The gairdener's occupation.
If ere by chance ye meet a chiel,
Wi' careworn face an' een that reel,
An' doonbent head, then mark him weel—
His wark is cultivation.

Auld Milton said—I have heard tell
When Adam's curses cam' pell mell,
That maistly on the ground they fell,
As aff his head they glinted.
I weel believe't: the son o' toil,
Wha's lot hae fa'en to till the soil,
For want o' care will never spoil—
His sorrow's never stinted,

Lang syne, when Adam sawed his seeds,
Ere he began his evil deeds,
He ne'er was hathered pu'in' weeds—
Sae says the auld narrator.
But noo, as sune's we tak'a spade,
An' get oor bit o' gairden made,
Gaints us we quickly find arrayed
The very pooers o' natur'.

If even the seasons had the grace
To come in turn an' keep their place,
We wadna' hae sae much to face,
Nor view wi' consternation
In summer, when we look for heat,
We're cursed wi' shooers o' hail an sleet;
An' autumn's early frosts complete
The work o' devastation.

The rain has ruined oor crap o' Peas
The blight has spoilt oor Aipple trees,
Oor grozers covered wi' green flees;
An' then the festive snailes
Did quickly seal oor Cabbages doom;
Sma' wonner tho' we fret an' fume
To see oor best Chrysthan'mum bloom
Nabbed by the forky-tailies.*

Oor foes are mair than mind can grasp—
The grub the weevil, bug, an wasp,
Worms for the Carrot an' the Rasp—
In truth their name is legion.
But, faith, I'll shak' the gairden mud
Frae aff my feet afore I'm wud,
An' quickly pack ilk stick an dud,
An' try some ither region.

Hortus, in the "People's Journal," N.B.

THE USEFUL TAMARISK.

Our readers, who chiefly know Tamarisk as a valuable seaside plant, will be interested in the following account, quoted in a recent number of the *Agricultural Gazette of New South Wales*, of the usefulness of the Tamarisk as mentioned by Dr. Seven Hedin in his work *Through Asia.* The latter author says that in his journey across the terrible sandy desert of Takla-Makan, the last vegetation he saw—that is the plants which euroached the furthest into the desert—were the Tamarisk bushes; and the first he met with again, after passing through the worst of the desert, were the Tamarisk bushes.

"We were now" he writes, "entirely amongst the sand. The last of the Tamarisks which still defied the visitation of death was left behind. There was not a blade, not a leaf to be seen, nothing but sand, sand, sand—fine yellow sand, whole mountains of it stretching over boundless spaces as far as the eye, with tbe field-

* Earwigs.

glass to help it, was able to reach." After travelling for days and days through similar country, at last, "All of a sudden, Kasim stopped short, gripped me by the shoulder, and with widely staring eyes, pointed towards the east without uttering a word. I looked and looked in the direction towards which he pointed, but could see nothing unusual; but Kasim's eagle-eye had discovered on the verge of the horizon the green foliage of a Tamarisk—the beacon upon which all our hopes of safety were now concentrated. We steered our course straight for the solitary tree, taking the utmost precaution not to lose its bearings. At length we reached it. Our first act was to thank God for bringing us so far safe. We revelled in the green freshness of the tree, and like animals, chewed away at its sappy leaves. It was really alive. Its roots evidently went down to the water stratum. We were now within reasonable distance of open water. The Tamarisk shot up from the top of a sand-due and there was not a yard of flat, hard ground anywhere near it. A strange existence these Tamarisks (Tamarix elongata) lead. Their branches and tough elastic stems, seldom exceeding 7 feet in height, are bathed in burning sunshine, while their roots penetrate to an almost incredible depth, and like syphons suck up nourishment from the subterranean supplies of moisture. In fact, that solitary tree reminded me of a Water-Lily swimming, as it were, on the billowy surface of the desert ocean . . . . I gathered a handful of the leaves, which were not unlike the needles of the Pine, and thoroughly enjoyed the sweet fresh scent they gave off."—*Gardeners' Chronicle.*

RUBBER IN PERU.

PERU (MOLLENDO).—In a recent Consular report it is stated that the rubber industry still occupies a good deal of attention, and although the quantity shipped this year only exceeds last year's output by 15 tons, this is accounted for by the fact that large quantities are being prepared in the interior ready to ship when the dry weather sets in—from the beginning of April. A few remarks on the difficulties that attend this industry may be of interest. From the time of landing here, about 15 days will be occupied in travelling by train, steamer, mule, and canoe to get to the rubber districts. The first range of the Andes has to be crossed at 17,500 feet above the level of the sea before the descent into the valleys can be effected. Sorata, in Bolivia, is the place at which nearly all the roads into the rubber and mining districts converge. The traveller will often be delayed for several days, as all the owners of beasts of burden take advantage f the scarcity of means of transport, and extort the highest possible freights for their animals. Once work has been started, the cheaper plan is to buy mules and horses. All supplies have to be carried in, as scarcely anything can be purchased there. However stores are gradually being established on the different claims. The descent is very dangerous in some places, the incline being from 30 to 45 degrees, and the animals often slip and are thrown over the precipices This part of the road, 23 miles in length, takes 12 hours, when Pararani is reached, 4,600 feet above sea-level. From Pararani to Mapiri the road is more practicable, and rubber, Peruvian bark, and coffee plantations are met. Mapiri is the centre of these regions, and from there one strikes off to wherever the claims may be. At least 90 per cent of the travellers fall sick with malarial fevers, more or less intense, although seldom fatal. From Mapiri, Guanay is reached in canoes, or rafts, made of nine sticks fastened with vines; three of these rafts form what is called a callopo, capable of carrying 1½ tons of cargo. The distance is 62 miles, and can be done in one day, going down stream, but coming back it takes three days, the current running six miles an hour. The Indians can only pull at the rate of 1½ miles per hour. From Guanay there are roads that lead to the placer mines on the rivers Tipuani, Covahuira Challana, etc., in which regions gold is found in abundance, but machinery is badly required, especially to dredge the rivers.—*Imperial Institute Journal.*

THE PITCHER PLANT AS A PLANT PROTECTOR.

One of the greatest enemies to Orchid plants in the West Indies is *Blatta americana*—the American cockroach. Numerous are the traps devised and the poisons compounded for the destruction of this insect, and yet it does not appear to decrease in numbers, and regular plans of trapping and poisoning must be adopted by the cultivator if he is to keep his Orchids free from these—almost ubiquitous—enemies.

There are however, natural checks which deserve attention. First among these comes a large spider, commonly though erroneously* known in Trinidad as the "Tarantula."

This spider, with other large species, are very bitter enemies of the cockroach, and assist not a little in preserving the balance of Nature. When it is mentioned that one of these creatures is large enough to capture and kill a full grown mouse—an occurence once witnessed in the Berbarium, and recorded in the *Bulletin*, January, 1895—it is easily understood how the cockroach falls an easy prey to it.

Poultry and larger lizards also feed upon the cockroach. To the barn-yard fowl it appears to be a specially delicate morsel, as is recognised by the negro proverb "When cockroach gib' dance, him no ax fowl."

We have recently observed the help given to the cultivator in the destruction of these depredators by the various species of Nepenthes or pitcher plants. As they assume full development, the Pitchers developed on the end of the leaves become filled with liquid, into which the cockroach is apparently attracted and eventually drowned. The liquid contained in the pitchers is of a similar character to the gastric fluids of the human stomach, and renders any animal-matter fit for absorption by the plant, so that the cockroach is ultimately digested as plant food.

The Nepenthes have been found to be so useful for this purpose that they have been deemed advisable to largely increase the, number of these plants among Orchids, as the damage done by the cockroach has been largely decreased by their aid. The various species of Nepenthes thrive well in the climate of Triniad, and are grown in suspended baskets made of Cedar-wood, in a similar manner to Orchids.—*Bulletin of the Trinidad Botanical Garden, October*, 1902

MANURES FOR VINES.—As a result of numerous experiments recorded in the *Comptes Rendus*, Messrs. Guillon and Gouirand show (1) that on a calcarious soil the effects of the application of chemical manures do not show themselves till after a considerable interval, (2) that potash salts are the most effectual then phosphatic compounds and hastily nitrogenous manures; (3) farmyard manures is highly valuable; (4) chemical analysis of the soil does not give sufficient indication of the kind of manure that should be employed. Experiments followed out during several years are alone capable of guiding the cultivator in his selection.—*Gardeners' Chronicle.*

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* Lycosa tarantula, the true trantula, is only found in Southern Europe, and differs in many respects from the West Indian insect, which has been determined as Eurypelma versicolor, Walk., and is sometimes spoken of as a species of Mygale.

VANILLA GROWING AND CURING.

(*Concluded from page 522.*)

GATHERING THE CROP.

Nine months after the flowers appear the beans should be fit to gather. Before this they show the approach of maturity by changing from a dark to a light green, and here very many are harvested when they reach that stage. Many of the beans so gathered spoil in the curing and the balance are always liable to mould when packed.

The bean of *V. pompona* which is not liable to split upon the vine should be left, until it has assumed a distinct yellow tint. It can even be left until the lower end begins to turn brown. Beans gathered in that stage will not spoil in the dying. The plantation should be gone over carefully twice a week and the ripe beans removed singly, being careful to separate the bean at its junction with the stem as the upper end is very easily broken. The practice obtaining here, of cutting off the whole bunch as soon as the first bean shows signs of ripening is a bad one. As several weeks elapse between the opening of the first and last flowers so it is with the ripening of the beans. Consequently when the first bean on the bunch is ripe the latest should not be in a fit condition to pick.

V. planifolia owing to the tendency of the bean to split cannot be left so long on the vine. This must be gathered when the lower part of the bean begins to turn yellow or even when the line up the side of the bean becomes yellow.

CURING.

This is the most important and difficult part of the work of the planter, and if neglected, will render all the previous work abortive. Any one can grow Vanilla but it requires care and experience and constant attention to cure it well. The following are methods which have proved successful with me, and by following them the beginner cannot go far astray, but a year or two of practical experience will be of more service to him than all that can be written. I will first give the methods employed by me in curing *V. pompona* which, however, cannot be applied to *V. planifolia* without incuring too great a loss in split beans. When the beans are first gathered they are taken to the house and spread out, where the sun cannot strike them, six or eight inches deep, upon the floor or shelves, until they turn brown. This takes from one to three weeks, depending upon the state of maturity of the beans, when picked. Beans picked too soon, will sometimes lie for six weeks before turning brown. Those which have been thoroughly ripe when gathered begin to turn brown at the blossom end, those which have been picked before maturity, at the stem end or in the middle. When the beans have arrived at a uniform state of colour (a deep red brown) they can be exposed to the sun. I use wooden trays for this purpose, three by six feet and two inches deep in them. For the first two or three days' exposure it is immaterial whether the beans be covered with blankets or not. They should be turned two or three times during the day, bringing the bottom beans uppermost each time, so that no one part of any bean is exposed for too long a time to the sun. This applies to the whole period of curing and is of the utmost importance. If neglected, some of the beans are sure to be burnt red by the sun.

About three p.m., or whenever rain threatens, before the sun has lost its power, and while the beans are still hot, the trays are removed to the house, stacked one upon the other and covered with blankets. The beans thus retain their heat through the night. At the close of the third or fourth day the beans are removed from the trays and packed while hot into tins and closely covered. (*Here we use old forty pouds biscuits tins for the purpose.*) In these tins they are allowed to remain for a couple of days, when they are again spread on the trays and exposed to the sun as before. Upon being removed from the tins it will be found that the beans have sweated and are covered with moisture, while there will be considerable water in the bottom of the tins. After the first sweating the beans must never be exposed to the sun unless covered with blankets. Some authorities are unanimous in stating that black blankets are essential, but I have never seen a black blanket used. The kind that we almost invariably use are condemned French Army or Navy blankets, and these are of a dark olive green. The heat, dampness and oil of the Vanilla, very quickly rot the blankets which are used for this purpose. From this time onwards these processes are alternated a day in the sun and a day or two in the tins, until the beans are nearly dry. When, however, the beans have begun to shrivel and are soft and pliant, they may be left for a couple of weeks at a time in the tins, without sustaining any damage, only the tins must be kept as nearly air-tight as possible.

As some beans dry more rapidly than others (the best beans always takes the longest time) towards the end of the drying operation, they must be sorted over and the dry beans picked out and this must be done before each exposure to the sun. The bean must not be too dry. It must be of a dark chocolate brown pliable but not "mashy" when rubbed between the fingers. The corrugations formed in drying must show distinctly and not disappear when the bean is bent and drawn over one of the fingers and it should have an oily look and feel. When the beans have arrived at this sorting stage they should never be exposed for too long a time at once to the sun, not for more than half a day at a time and during that time should be turned at least twice. This is to prevent their being burnt by the sun. One thing deserves particular attention, however. The beans must never be spread upon the trays, exposed to the sun, less than one inch in depth. If spread singly the stalk end of some is sure to burn. Another method which I have tried follows the course pursued in the preceding until the beans have lost about half their weight or rather more and have become sensibly wrinkled. They are then spread singly upon frames, covered with wire cloth, thin sacking or netting in a house with plenty of ventilation and allowed to dry there. The frames require looking over every second day, to pick out the dry beans. Either process makes good vanilla. The second is the safer but requires more house room and requires a little longer time. There appear to be many ways of curing *V. planifolia*. Three of these I have tried and will describe. These are, by means of the oven, hot water and exposure to the sun. The object of all is as far as possible to prevent the splitting of the bean. *V. planifolia*, unlike *V. pompona* which seldom splits on the vine, and never after it is gathered, is liable to split during the process of curing and this greatly depreciates its value. Hence more care has to be taken with it, than with *V. pompona*. For all these processes the bean is taken as soon as gathered from the vine, and is not allowed to get brown as is *V. pompona*.

THE OVEN PROCESS.—For this an ordinary brick or stone "bake oven" is requirad, which is heated in the ordinary fashion as for baking. The heat is then allowed to decrease until it reaches a temperature of from 150 degrees to 180 degrees. The right temperature for any particular oven can only be ascertained by experiment. The Vanilla has already been prepared by putting it, carefully laid head and tail, and as far as possible beans of the same length in the same package in packages of one thousand beans, wrapped first in green banana leaves and then in rocking, thoroughly saturated with water and secured tightly around the package. These packages are then arranged in the oven upon a platform of battens, to keep them from touching the bricks and then that is closed and left for from twenty-four to thirty-six hours. The time here is also a matter of experiment as

the capabilities of each oven are different. Upon removal from the oven the beans should have become of a uniform light brown colour. They are then spread between blankets and exposed to the sun for six or eight days being rolled up in the blankets at night. At the end of that time they should have become soft and wrinkled and are removed to the house and spread on frames to complete the drying process. They remain on the frames for about a month.

By Hot Water.—The freshly-gathered beans, in small baskets are plunged for from fifteen to twenty seconds in water on the verge of boiling, that is at a temperature of from 185 degrees to 195 degrees Fahrenheit. They are then allowed to drain for a few minutes, but before the beans can become cold they are put in a pile and allowed to sweat for from twenty to thirty minutes. They are then treated as in the previous process, by exposure to the sun, &c.

BY SUN ALONE.—The fresh beans are spread thinly between blankets and turned several times during the day and rolled up in the blankets at night, for the first two or three days. The after treatment is the same as with the others. In all these process the beans require to be rolled up in the blankets about three p.m., while still hot and packed in some tight receptacle which will retain the heat, until they can be exposed to the sun on the following day. What has been said about the sorting out of the dry beans of *V. pompona* applies equally to these.

As soon as the dry beans have been picked out they are packed in tins and tightly covered, both to prevent any further drying and to render the ends of the beans as pliant as the rest, preparatory to the measuring, which is the next in order. For this a measuring board is required. The most convenient that I have found is simply a piece of quarter or half inch board, three inches wide and fourteen inches long, with a small quarter inch cleat nailed on one end. From this cleat a scale of quarter inch interval is marked on the middle of the board from four to elven inches. Neither of these extremes is frequently used. By drawing the half-inch marks twice as long as the quarter inch and the inch marks as long again, they are more easily distinguished apart. However, even when cut in with a chisel the marks are very soon obliterated by the oil and coloured matter from the Vanilla. The difficulty is obviated and the numbers can always be seen, clear and distinct, by simply marking the scale upon a piece of paper pasted upon a two inch strip of glass so that the scale can be read through the glass and bed the glass, paper side down, in soft putty in a hollow in the measuring board, so that the surface of the glass is level with the surface of the board. No matter how discoloured this may become a rub of a cloth brings out the scale as clear as new. Having his board prepared, the measurer sits at a table with the cleat end of the board next him and (having previously sorted the beans with the blossom ends all one way takes a handful in his left hand, places one of these with the blossom end touching the cleat, holds it there with the left and straightens out the stem end upon the scale and reads its length. Having previously arranged in his mind a place on the table for each size, the bean is put into its place and another measured and so on until all the beans are measured. It is convenient to arrange the work table as shown in the following diagram:—

9¾,	9½,	9¼,	9 in.	Measuring	6 in.,	6¼,	6½,	6¾
8¾,	8½,	8¼,	8 in.	Board.	5 in.,	5¼,	5½,	5¾
				*				
,	7½,	7¼,	7 in.		4 in.,	4¼,	4½	4¾

A good plan for the beginner is to write a label for each size and place these on the table as a guide. In a short time however, nothing of this sort will be required. If one has a large quantity it is advisable to devote a seperate tin to each size. With small quantities, when the day's measuring is finished, the beans are simply tied in large bundles by a string around the middle and a label of the size is attached to each. These bundles are then packed away together in a tin. With Vanilla as with all other things, the neatness of the package has a great deal to do in aiding the sale, and great care should be taken in the making up of the bundles. It is surprising how different the same beans will appear when carelessly tied and when proper care is taken.

For different markets, different sizes of bundles are preferred. For the French, the beans are tied in bunches of fifty beans and tied with three strings, one at each end and one in the middle. For the New York market, bunches of from seventy to ninety beans, tied at the two ends only are preferred, and for that of London, bunches of the same size, tied with a single string in the middle. For my part I prefer the bunches tied with two strings. Those tied with one string only, in the middle, look very neat, but if one has many crooked beans, it is almost impossible to make them look neat. Those tied with two strings cause no trouble, and "tell it not in Gath," it is besides possible to conceal a few split beans in each bunch. This is necessary with *V. pompona* as there is but one grade and no market for splits. Of course with *V. planifolia*, where quality tells, I would bunch all the first class by themselves and would then tie with one string. To make a bunch, take first sufficient beans to form a moderate handful. These will be found to range in number from seventy, for the longest, to ninety for the shortest beans. It is advisable to have the bundles of the same thickness, both for looks and convenience in packing. From this handful select the best and straightest beans (sixteen for a bunch of fifty up to twenty-one for a bunch of ninety) and lay them to one side. These are to form the wrapper. It will be found that the stem ends of the bean almost invariably turn to one side. In making up the bunch it is necessary that these should all be turned inwards to the centre. Thus, holding the bunch in one hand, squeezing and rubbing the beans together, with both hands and frequently tapping the flower end of the bunch upon the table, in order to keep the ends of the beans level, the other end is examined, and all beans, whose ends are seen to point outwards are turned so that they point to the centre. This being done and the beans again squeezed together, the wrapper beans are put on one after the other until the bunch is encircled by them. After again squeezing the bunch and tapping the lower end, a string is tied moderately tightly around the middle, in order to keep the beans in place untill the ends are tied. The flower end is tied first. By tapping this end on the table the ends of the beans are all brought level, when a string is tied fairly tightly around the bunch about a quarter of an inch up. The bunch is then drawn through the hand, using considerable pressure, from the flower end, watching at the same time that every wrapper bean is straight and in place and then another string is tied about the stem ends. The middle string is then untied and the bundle is finished. This gives a neat bundle.

The string usually used here is common white cotton twine. The best tying material is either Raphia or bast. I use the inner bark of the paper mulberry, soaked for a couple of days in water, and then bleached in the sun. This is nearly as good as Raphia and is cheaper, costing only the labour to prepare it, the "purao" or paper mulberry being our most common tree. The French method slightly differs from mine. It is a good one when the bundles are to be tied with one string only. By it after selecting the wrapper three beans, others, the straightest, are selected, to form a core and the others placed singly around these, circling round and round them and finishing off with the wrappers taking care always that the stem ends point to the centre. Mine is, however, the quickest and is fully as good when the bunches are to be tied with two strings. Here, for shipping the bunches are

* Operator.

wrapped singly in a paraffine paper, packed tightly in tins holding abont eighty-five pounds each. These are soldered, air-tight and then crated, usually two in a crate, Good Vanilla packed in this way will keep for years. The advantage of wrapping each bundle in wax paper is that in case a bad bean has been packed and becomes mouldy the mould does not extend beyond its particular bundle.

NOTES.

DISEASES.—Vanilla is subject to several diseases, one of which attacks the partially grown bean, causing it to rot and fall off before maturity and another attacks the lower part of the vine, causing it to wither and dry up, while the upper part continues growing although in a partially withered condition until it can send down air-roots when these reach the ground the plant revives. Any beans which were on it at the time however are a loss. I know of no remedy for either, except replanting. The disease which attacks the bean appears to be worst in rainy weather, and in dense shade.

I think that most of our Vanilla is grown in too deep shade. If the ground is kept shaded and cool by a covering of leaves, rubbish or weeds, the vine itself will stand a very considerable amount of sun. Beans grown in the shade are usually longer than those grown in the sun but they do not carry their thickness to the stem end as do the others, and therefore require more care in curing, as the thin end is very liable to burn. In the blooming season I find it advisable to start fertilising the flowers in a different part of the plantation each day. I think that the flowers fertilised in the morning give the best beans, a shower may come up and stop the work when it is only partly finished, or a very heavy bloom may necessitate some flowers being left unfertilised. Hence beginning in different places is likely to make the crop more uniform than if work was begun in the same place every day. A species of slug has been found eating a few of the flowers, but does but little damage. Our worst enemy is a lovely little green dove which eats the buds before they expand. These are natives of Tahiti, and have learned that Vanilla flowers are edible, by some chance, and the knowledge is evidently inherited. The gun is the only remedy. I have seen it stated that the beans have to be dipped in hot water to destroy insects and their eggs and afterwards kept covered with gauze to keep insects from them. I have not found this correct. The reason for dipping in hot water, I have already mentioned, namely, to harden the skin, keep the bean from splitting, and hasten its drying. I know of no insect which attacks the drying or the dry bean. This statement, however, does not apply to the poision of the Vanilla bean, and which some claim is due to a mite living upon the dry Vanilla As to the existence of the poison, I can vouch. As to the cause, I am in doubt; but I incline to think that the poison is a vegetable one, and is inherent to the bean. The sap of the vine is in itself acrid or poisonous, although it is not always noticed. On rainy days or when cutting the vines, either in pruning or making cuttings, it makes itself felt by an irritation and itching of the skin of those parts most exposed to it, the hands and face especially. This, however, does not last for any length of time after quitting work.

The other poison, that of the bean, is different in in its action, and differs also in its action upon different persons. Some few are exempt. On others, myself for one, after constantly handling the drying and dry bean very small watery pustules make their appearance, usually between the fingers and upon the back of the hand. These itch incessantly. In the worst cases, sores break out upon the head, body and limbs, and the itching is intolerable. Lately a remedy has been discovered, and having tried it upon a number of fellow sufferers effecting a cure in every case, it may be held to be a specific. As a boy I used to be poisoned regularly every spring by the poison ivy or oak (*Rhus toxicodendron*), and it appeared to me from the similarity of the symptoms that the remedy used for that, might have an effect upon the Vanilla poison. The lotion is made as follows. Mix equal parts of carbolic acid, glycerine and rose-water, and rub upon the parts affected. The effect is instantaneous, and it at once allays the itching, and in a short time effects a cure. As a preventive, when handling much Vanilla, workers may use Calvert's 20 per cent. carbolic soap for cleaning hands and face, and if this practice is followed, they will seldom be troubled with a renewal of the affection. It is a matter of tradition here that a kanaka, inserted a four inch wire nail in many of his dry beans, thus selling nails at the price of Vanilla and profiting much thereby. This is a most reprehensible proceeding, and one which cannot be recommended. It is, however, recommended to use great care in not getting the beans too dry. Get them just dry enough not to spoil when packed. Every pound of moisture which the beans lose after that point is reached is just so much clear loss to the grower. It is recommended by some to rub oil over the beans when they are dry. The only oil which should be used is that which can be got from split and damaged beans. By rubbing these with a woolen rag in a short time that will become saturated. The good beans can then be rubbed with this and the few occasional drops which come from some of the beans will keep the rag sufficiently oiled. In beans cured in the sun the skin is always oily. Beans cured by the use of hot water or the oven only need the oiling. For first class beans it is worth while resorting to what the French call "dressing.' That is when nearly dry drawing the beans through the fingers, thus straightening them and distributing the seeds and oily matter evenly throught the length of the beans. For the cheaper grades it takes too much labour. Throughout this article I have referred to the fruit of the Vanilla plant as the "bean." This I know is incorrect, but as they are invariably so called, it has been considered best to conform to custom. As regards the cost of making and keeping up a plantation it is not worth while going into figures, conditions being so different in different countries. I may state that in four years from the time of planting on a leased plantation in Tahiti the returns showed on the right side of the balance sheet. The yield per acre is of course variable, depending upon the number of plants grown their age, &c. A plantation will give two hundred pounds of cured beans is a good one, although two hundred and fifty pounds can be grown. After the plantation is made there is work enough on five acres to keep two men constantly employed, besides which extra labour is required during the flowering season, and also for drying the beans. I recommend planting both *V. planifolia* and *V. pompona* in places where labour is limited or hard to get as by so doing, the two varieties flowering at different times, double the area can be handled with the same amount of labour during the flowering seasons. By keeping a record of the number of flowers fertilised the planters can tell very nearly what weight of beans to expect, when the bean matures. I estimate that each thousand flowers fertilised ought to productfive pounds of cured beans. This allows 25 per cent for loss, and I have found this fairly correct. Ordinary beans weigh on the average one pound for each packet of one hundred and fifty beans.

Green beans run at about forty to the pound, and the loss of weight in drying is about seventy-five per cent.

[NOTE BY EDITOR.—It is not quite clear whether the *Vanilla pompona* spoken of by Mr. Mc Farlane is the same as that so known in the West Indies, and wanting an accurate Botanical description it is difficult to ascertain whether it is so or not. It is quite correct, however, as regards the splitting. Our *V. pompona* does not split, but it appears to be a larger plan, and produces a larger bean (triangular in shape) than the one he describes.—*Trinidad Bulletin for August.*]

PLANTING IN PHILIPPINES.

Sir:—I came to these parts early in 1871, with the intention of devoting myself to agriculture and, after two years of inspection and stndy of different districts, finally located in Bangui, (to-day a town in this province, but then scarcely more than a settlement), where soil, temperature and situation fulfilled my aspirations.

I secured from the state 600 hectares of ground which contained soils suitable for growing sugar, coffee, indigo, tobacco, cotton, rice and all the plants indigenous to the country, feeling confident that I should also be able to secure a large portion for those of colder climes.

Many were the difficnlties with which I had to contend, but my courage was sufficiently great to enable me to do so. I canvassed among the farmers and in three years succeeded in collecting 200 colonists together with their families from the various pueblos. The crops to which I devoted my attention at first were: rice, to supply food; cotton, to furnish clothing; indigo, to provide colouring matter; and tobacco, as a luxury. These imperative necessities having been atended to, I decided to grow.

COFFEE.

which had from the beginning been my main object, being encouraged thereto by the magnificent results achieved by early experiments. One difficulty presented itself which caused me many a misgiving; this was the slight elevation of the land above sea level; but, taking into account the fact that the winds, before reaching the plantation, necessarily crossed a fine forest of magnificient trees and, therefore, had become purified of the elements prejudicial to the growth of coffee I decided to undertake its cultivation.

In four years I succeedsd in planting 600,000 trees, which were the envy of all who beheld them and which promised excellent returns for labour and money expended. In 1889, when the planation commenced to bear fruit, there appeared an insect known as the Bagombon (a species of grub), which entered the plant in a larval condition, leaving no external evidence of its mode of entrance. This insect completely destroyed the inner structure of the plant, though outwardly there was no visible sign of destruction, until the plant had been converted into a limp, serrated stalk, the plant then assuming a yellow colour and having been brought to so weak a condition that the slightest breeze was sufficient to overthrow it. The work of destruction, I have observed, takes a downward course, beginning at the top of the stalk, so that but little is left in a sound condition that wonld enable it to sprout again. This has been the cause of very great loss to me in three or four years, whereas a single crop would have reimbursed me for all expenditnres.

After having replanted a large portion of the land in 1889, another disease appeared, which has not up to the present time been identified, but which destroyed nearly all of the plantations of the adjacent country. On my own plantation I first noticed it in September 1889. It made its appearance in sections and in a manner which greatly surprised me. I at first attributed it to the vast rainfall during the months of Angust and September, but was soon convinced of the serionsness of the matter. The weather improved, and new spots appeared. Then I nndertook a series of experiments in my endeavors to effect a cure, which consumed my savings and proved fruitless. I then solicited the aid of an intelligent person from the Agricultural School, who might study the disease. They sent an engineer, and he came to the conclusion that the trouble was caused by a fungus or a parasite the remedy against which was either sulphur or sulphate of copper. I experimented with both of these, but with absolutely no result whatever, due in my opinion, not to the inefficacy of the sulphur or sulphate of copper, but to the fact that this was the season of the year in which the rainfall was greatest, and any work done in the morning was washed away by the rain in the afternoon. Under these conditions and lamenting the continuous great losses, we discussed the possible origin of so fatal a disease and began to snspect (though somewhat tardily) that the almost total disappearance of the first insect which disappeared simultaneously with the appearance of the second evil and which, while troublesome was not injurious, favored the development of the disease. This coincidence did not occur to me until after the lapse of some time. I endeavoured to act the part of a benefactor and would have succeeded, but for the revolution which destroyed the entire work of thirty years.

Another snbject to which I have devoted much attention is the cultivation of

CACAO,

There being no large plantations in which to study this plant, and the half dozen trees usually affording shelter to the homes of the natives being insnfficient for my purpose, I did not wish to undertake the work of planting on a large scale. I planted some 29 trees at different points, in different latitudes and in various soils. This study caused me so much trouble that I was on the point of abandoning it, but my inclination for the work triumphed and I succeeded in attaining my object. In 1894 I found myself in possession of the land reqnired; after 18 years of investigation I sncceeded in finding the soil. I planted some 20,000 trees and would have planted as many as 100,000 had I had sufficient fnnds to secure that number. This plantation is a beautiful one and bears well, though not for me, unfortunately. The cultivation of this tree requires conditions which are only to be found in large forests. If the plantations have a somewhat interior location and communication with same be somewhat difficult, it would be necessary in order to defend the fruit against the depredations of monkeys and other two and four-footed animals, to have six guns (impossible to obtain at the present time) and an equal number of men who would be willing to live there, the latter being even more difficult to secure than the former.

One of the most important considerations in the cultivation of cacao is the selection of seed. Great care must be exercised in this selection, for otherwise while beautiful trees may be grown, they will not bear fruit. This selection should always be made by the person interested and not-entrusted to another, if the owner does not wish to run the risk of failnre.

In my opinion, a plantation of cacao is one of the most profitable undertakings, if the soil be selected with care, permitting the white man to work with comparative comfort in shaded soils.

As is the case with coffee plants throughout the province one may see cacao trees which thrive in the shadow of banana trees or of buildings. Therefore, no hard and fast rule can be laid down governing the point of location; however, as I have said, the pneblo offering the best conditions for its cultivation, is Bangui.

TOBACCO.

The cnltivation of this product was monopolized by the State until the year 1882, when it was declared free. Until that time its cultivation was carried on under the direction of competent persons employed in all the towns by the State, and the ontpnt for the entire provinces fluctuated between 500,00 and 300,000 bales of a quality superior to that prodnced to-day. After it had been declared free many of the labourers forsook its cultivation and began a custom which soon became a vice,

Commercial honses were not lacking to take the place of the planter, with advantage to the State, when suddenly appeared the great destroyer of Philippine agriculture, the China-man, who received the article, in any form whatsoever, though at the lowest price In view of the fact the planter, having but little need to economise labour, forsook every rule of careful cultivation, simply trusting in Providence to bestow upon him the few pesos he required. The efforts of these commercial houses were frnitless to preserve the quality, if not the quantity; they found themselves compelled to reduce the prices—all of which cause

interest throughout the province in its cultivation to languish. Notwithstanding this, the Chinaman profited by the state of affairs, and proceeded to gather to himself anything and everything in the shape of tobacco.

I cultivated it for some years, long enough to recognise the requirements of its cultivation, but abandoned it when I found that it was utterly impossible to direct the colonists,

INDIGO

This product largely cultivated, the natives simply growing a sufficiently yields well in this province, but it never has been large quantity to enable them to provide themselves with their trousers and shirts. Not so, however, in the neighborhood of Ilocos Sur, where there was a great abundance of this product until the Chinaman—the ever evil-doing Chinaman—commenced its adulteration, resulting in a loss of confidence in the market and a consequent depreciation of the article, until its cultivation.

COTTON.

This is generally grown in soil of poor quality and in a manner leaving much to be desired. The variety is a good one, but the yield very scarce, due to faulty cultivation. Within the last few years it has been grown in greater quantity, but always for domestic use. Now, due no doubt to the importation of fibres from foreign countries, there is constant improvement in its cultivation.

CORN.

Corn is planted in all of the pueblos, but on a small scale, this province being essentially a rice-growing section. Only in times of scarcity of corn in the market, is the crop used for food purposes, it being generally fed to fowls and hogs.

On my farm in Bangui I have experimented with seeds from various countries, which yielded very well for two years; in the third year, however, it began to degenerate, due more to deficient cultivation than to the climate or soil.

SUGAR-CANE.

This is planted in all the pueblos throughout the province in small quantities, though only for vicious purposes, that is, the sap is allowed to ferment with the flowers and leaves of the tree called lama, resulting in a beverage which is preferred to the best qualities of foreign countries. Some planters convert a portion of their crop into panocha, which they send to Cagayan.

The soil, in spite of deficient methods of cultivation, yields much sugar, it being very suitable for growing this crop.

RICE.

This is the most important crop of the province and is planted in moist lands, which abound in all of the pueblos; and even in dry lands it can be grown; if one takes advantage of the rainy season. Different seeds must be used for dry and moist lands, and of these two distinct classes there are again many varieties. This plant is cultivated according to methods acquired during a period of four hundred years, in all of which time there was no human intervention to cause them to relinquish their ancient methods.

Aside from the crops mentioned, there are also grown on a small scale lentils, oton, beneseed, resin and others, of less importance—all for consumption in the interior.

For twenty years the pueblos of Batac, Badoc, Bangui and Sinain have been planting some wheat, which did not yield badly and furnished an excellent quality of this article to the foreign colony in this province until the arrival of flour from other parts, which speedily ruined all chances of cultivating it to advantage.

Now as regards vegetables, tomatoes are grown throughout the entire province and are used extensively by the natives; also egg-plant, amargoso, squash, cucumbers and others. The foreign plants grown are lettuce, endive, pepper, spinach and beet. These latter are used by the foreigners for food.

On my farm in Bangui I always had a pretty little garden in which I planted Spanish greens, which yielded abundantly. Among others I several times planted large quantities of potatoes and obtained fruit of a better quality than that coming from China: the same with beans, which were of a superior quality whether fresh or dried.

I place myself entirely at your service, and remain.

(Signed), Emilio A. Y. Lallave.

—*The Manila Times.*

FRUIT TREES IN POTS.

A LITTLE OBJECT LESSON.

W. S. CAMPBELL.

The efforts now in progress, in many of our public schools, to make use of portions of the school-grounds for nature teaching and simple experiments in plant growing are greatly to be commended for, doubtless, such work, when properly systematised and carried out cannot but have an important bearing upon our future horticulture, agriculture, and forestry.

With a view to assist such praiseworthy work in a slight degree, as well as to serve as a sort of guide for those readers who may carry out experiments interesting, useful, and at the same time so simple as to be within the scope of anyone, I will give some results, acquired under extremely disadvantageous conditions and surroundings, of fruitgrowing in pots, as well as information as to the methods adopted.

I may say that when I came to live in town, or rather close to town, after having lived all my life on a large area of land, and was confined to a small garden-plot and a miserable back-yard, I felt choked and wretched. The garden was so absurdly small that it seemed hardly worth while to take off my coat to keep it in good order; and it used to make me laugh when I saw the time it took the jobbing gardeners to tidy up the wee gardens of my neighbours. To my astonishment I found that none of the neighbours, performed any gardening work, beyond an occasional watering with a hose.

After a time it occurred to me that I might as well put my few square feet of space to some better use than the usual prim and absurd little cow-pat designs, concocted of echeveria, altemantheras, and suck-like plants, and I may say that I have succeeded to a remarkable degree.

Hundreds of valuable plants, economic and ornamental, have been given away by me to persons in several States of the Commonwealth; and lately I have sent away a vast number of plants of Mr Farrer's introduction, the new Paspalum, *P. virgatum*, which, I think, will prove valuable for cold districts where the famed *P. dilatatum* will not thrive so well.

In this garden, which is generally but designedly in a lovely muddle, are growing a wonderful variety of species of plants such as grasses, saltbushes, fruits in pots, roses, annuals, perennials, bouvardias, cannas —seedlings and otherwise,—dahlias, rice, water-lilies bulbs of numerous varieties, some native plants of New South Wales, straw-berries, violets, nardoo, Japanese roses, seedling roses from Kew Gardens seed, and many other things besides, with seedling grasses, of value for distribution, but which more often than not give this garden an appearance of neglect and wildness.

The soil is naturally poor sand, and I discovered to my disgust that apparently all the rubbish after building such as broken-up slates, stones, old iron, and I do not

know what besides, had carefully been hidden a foot or so below the surface. However, I manage to make the plants grow as I wish without much trouble. My worst enemies are the winds which often sweep like cyclones around here, smashing up everything in a glorious confusion, and the cost of pots to replace those broken often amounts to something serious.

Notwithstanding such little troubles I have managed "fair to middling" as the saying is, with my pot-plants, and I wish to invite particular attention to the fruits in pots, especially to the little peachtree shown in the illustration; indeed, this is chiefly the object of the article.

Fruit in pots are but rarely grown in this State. Occasionally grape vines are shown in pots bearing large bunches of grapes; but this work is a dodge, and not worth describing here. In the countries where fruits in pots are chiefly grown the plants are sheltered generally under glass, and the pots are set in earth, and not infrequently the roots are allowed to grow through the drainage holes into richly prepared soil, which allows a great extension of root.

As this sort of practice did not suit my design, I grew the pot-fruits in the garden, but not plunged in the soil, and I prevented the roots from growing through the drainage holes, my object being to ascertain possibilites of the production of fruit-trees having limited or rather restricted root-areas.

The little peach tree referred to has been grown in a 7-inch pot. The plant when given to me must have been about one year old from the bud, and I had to cut away most of its roots to jam it into a 5 inch pot with a few broken crocks and a little soil. Here it grew as much as I wanted for a year, and then I shifted it to its present 7-inch pot, in which it has been growing for about two years, bearing fruit.

The crop this year, which is shown in the photograph consisted of eight peaches, the average size of each being slightly more than 8 inches in circumference. the total weight of the eight being over 2½ lb. These peaches were beautifully coloured, luscious, and perfect far better than many peaches retailed in Sydney at one penny each at the time.

To ripen the fruit was my greatest difficulty, for I was obliged to keep the plant out of the sight of the numerous youngsters who are constantly passing along the street which bounds my garden, and in whom the instinct to provide themselves with fruit—apparently inherited from our Pithecanthrops or man-ape ancestor, is markedly conspicuous at an early age—and it has been a marvel to me how my peaches escaped detection.

In keeping the plant out of view as much as possible I was obliged to deprive it to some extent of the sunlight so necessary for its proper development and the ripening of its fruit.

Every fruit that set ripened; not a single fruit, strange to say, fell off, and I attribute this to an abundant use of water as soon as the fruits became as large as peas. As may be supposed the evaporation by this plant, growing in a comparatively small pot, was considerable, and it quickly appealed for water, if needed, by its drooping leaves.

Perhaps I have gone ahead rather too fast, for I forgot to describe the potting soil used. This was chiefly sandy loam, vegetable matter, a little charcoal and about a couple of handful of bone-meal. About one part of vegetable matter (old cow-dung for want of something better) to two parts of sandy loam. A better mixture, for anyone who could obtain it easily, would be loam, coarse gritty sand, and vegetable matter composed of rotted leaves. However it will not very much matter what the soil is, provided a good deal of vegetable matter is used in making a potting soil. Vegetable matter is of far more importance for cultivated plants, and particularly so in the field or garden, than is generally imagined, and I feel sure that in the near future a proper appreciation of this important subject will effect a marked change for the better in agricultural and horticultural production in Australia.

But to our pots again. The addition of a little bone-meal will be found of advantage, about a handful or two to the soil required for a 7-inch pot is sufficient. If bone meal cannot be obtained burn some bones and use the ashes instead: you will lose the nitrogen but the phosphate will remain. Whether the bone-meal or burnt bone is used for manure or not, its physical effects are useful, and so is the charcoal broken up into pieces about the size of wheat grains.

When shifting the peach from one pot to another in the winter, I washed its roots thoroughly, and cut about half of them away, and pruned the branches a little. About an inch of broken up pots was used for drainage in the bottom of the pot, a layer of broken up old cow-dung on top of this to keep the soil from washing down, then a little soil on which the peach roots were held, and the prepared soil, rather dry, was shaken in amongst the roots and pressed down well particularly round the sides of the pots, to prevent water and liquid manure soaking through too fast. Potting can be effected very quickly and neatly by anyone experienced in the work, but the operation is not easy to describe. When the potting was completed and the soil well pressed down, the surface of the soil was about an inch from the top of the pot to allow a good quantity of water or liquid manure to be poured in and soak gradually through the soil.

As soon as the peaches began to grow I began to use liquid manure, twice and sometimes three times a week, filling up the inch of space once and sometimes twice at a time after the plant had been watered.

I used a mixture of a handful of nitrate soda, a handful of 'blood and bone' manure, or occasionally fine bone-meal, a handful of sulphate of potash, and three or four handfuls of fowl-dung in an eight-gallon water-can of water. This formed a good sort of stock-pot. I used this liquid diluted at the rate of a gallon of liquid to a gallon of water. Sometimes I did not dilute it at all, when it was freshly made. I think it is better to use nitrate than sulphate of ammonia because the nitrate can be made use of by the roots sooner than the sulphate. Sulphate of potash was used because I found that muriate of potash sickened to death some nice strawberry plants in pots I was making experiments with. It may do as well as the sulphate fruit-trees, and may be worth trying, but I should not advise its application for strawberries except for experiment on a small scale.

I may say that I have found the use of fowl-dung for liquid manure alone most useful, far more beneficial, somehow, than chemical analysis would make one suppose. I used it largely, for many years, for garden purposes, with excellent effect, especially when made into a liquid.

Good liquid manure can be made from the dung of any of the domestic animals, particularly so from that of sheep; and for the growing of plants in pots, such as the peach referred to, one could hardly use anything better. But it is always as well to strain it before use in pots.

The apple shown in the accompanying photograph is eleven or twelve years old. I brought it from Melbourne eight years ago where it was raised from the ground, and I have grown it in a 12-inch pot ever since, occasionally, about every two years, repotting after cutting back the roots rather hard. It flowers well, but in consequence of my confined space and being obliged to keep it close to a fence, and in an unsuitable position, the outside flowers only are pollinated. No other apples are grown in the vicinity, so that the flowers have not the benefit of foreign pollen. Besides this the climate is not at all suitable for apples and I am rather surprised that it bears the excellent fruit it does. I adopt the same treatment for the apple as for the peach so far as the soil, watering, and manuring is concerned. This little tree has been grafted on a blight-proof stock, as well as on a dwarf Paradise stock, and no signs of American blight have ever appeared, but this may be due to isolation to some extent.

To grow dwarf trees in pots satisfactorily, a good deal of time and patience is necessary, but as they grow, and even before they bear fruit, most useful lessons could he taught with their assistance. Other kinds of plants also might he used for nature teaching, and endless interest might he inspired hy a good teacher who can infuse some little enthusiasm into his subject.

I should like to add that in school grounds, where space is available, a few dwarf apples aud pears might easily be grown as garden plants, Quite a number of varieties could be grown in a small area, if planted about 6 feet apart. They had better he grafted on blight-proof as well as dwarf stocks. In order to keep them within bounds, should they give indications of too strong growth, their roots must he pruned, one side or one-half the roots one year, and the other half the next year. The root pruning can be effected by means of a sharp steel spade. A little practice will soon enable any one to root-prune with ease. As for the pruning the heads of the trees, one need only study Mr. Allen's exhaustive articles on the subject, and if he cannot learn all he needs from these, why then he must be a dull person indeed?—*The Agricultural Gazette of New South Wales.*

THE PLANTAIN FIBRE INDUSTRY.

A MADRAS OFFICIAL BULLETIN.

The following are extracts from Mr. Proudlock's interesting "Note on Simple Machines for Extracting Plantain Fibre," just issued by the Madras Government:—

The objects of the present "Note" are (1) to again draw attention to the common plantain as a latent source of an immense quantity of fibre which has hitherto been practically wasted and which might he turned to account by the Indian ryots; and (2) to furnish some information about the two types of primitive machines which are believed to be in common use by the peasants in the Philippine Islands for extracting the fibre of *Musa textilis* (which is the plaintain largely grown there for the production of the fibre known in commerce as "Manilla Hemp"), as they are equally well suited for extracting the fibre from the common plantain

Although "Manilla Hemp" is yielded by a species of plantain, the fibre is altogether superior to that yielded by the varieties of plantain which are cultivated in India primarily for the sake of their edible fruits. So valuable is the fibre of *musa textilis* that it practically rules the market in white fibres; while the fibre obtainable from varieties of the edible plantain is, as a rule, valued as very little more than half the price of "Manilla Hemp."

The existence of fibre in the common plantain has probably been known in India from ancient times, and its value and utility have been brought prominently to public notice at intervals from time to time. In the early part, and in the middle of the last century, the subject came under the notice of many eminent men in India, foremost among whom was Dr. Forbes Royle who, in his "Fibrous Plants of India," pages 61-90 has given a great deal of valuable standard information about plantains and bananas and their products; while in this Presidency, Dr. Hunter, among others, seems to have taken a keen interest in the subject. At that time owing to the temporary suspension of the supplies of Russian Hemp to the English market by the occurence of the Crimean war, the Government instituted an enquiry as to the different kinds and relative values of fibres obtainable in this Presidency. The information obtained was interesting and valuable at that time; and it will be found embodied in "Selections from the Records of the Madras Government," No. XXIII. "Reports on the fibres of Southern India" published in 1856. On page 158, it is stated: The fibre is easily cleaned, but some simple machine ry is requisite of the description invented by Mr. Underwood or by Major Maitland, both of which appliances have been found on trial to he efficient." I have not yet seen any detailed description or plans of either of these simple machines, but so far as I am aware, they are not now in use by the ryots in any part of this Presidency.

Coming down to the present time, it would appear that the main reasons why the ryots do not yet make use of the fibre contained in the stems of the common plantain are: (1) their general ignorance of its existence; (2) the comparative abundance of other species of fibre-yielding plants which can be easily and profitably grown by them and with whose fibres and with the means of extracting them they have long been familiar; and (3) the want of some simple but efficient machine or appliance, suited to their means, for extracting the fibre.

The patterns of the two simple machines are shown in diagrams made from the descriptions given in the "Kew Bulletin." Additional Series II, I—Vegetable fibres; and in Volume IX, Part I, New Series 1891, pages 57-62 of the "Journal of the Agri-Horticultural Society of India." I especially desire to acknowledge my indebtedness to Mr. A Brown's "Sketch of a knife used by the Natives at Gubat. Philippine Islands for extracting the fibre from *Musa textilis*" on page 62 of the journal referred to. The essential principles in Mr. Brown's sketch and in my sketch of machine No. 1 are the same, although it will be observed that the fittings are slightly different in my sketch.

METHODS OF WORK

After describing these two machines in detail Mr. Proudlock continues:—

It must not he expected that an ordinary cooly can become really expert at the work of cleaning plantain fibre with one of these primitive machines without a considerable amount of practice. With a view, therefore, to getting a man to become expert at the work he should be kept steadily at it day after day for a month or more on daily wages. As soon as the employer is satisfied that the man can turn out what he considers to be a satisfactory quantity of fibre per day, he might suggest contract work to his man at so much per pound of fibre. The employer can easily calculate and settle for himself what rate he can afford to offer to his cooly or coolies for the fibre after ascertaining its current market value.

Planters, zemindars and especially the ryots and villagers who have plantains growing on their estates and in their gardens might, with the aid of these primitive machines very easily and without much expense obtain all the fibre necessary to make cords and ropes for their own requirements. Should either or both of these patterns of primitive machines ever be adopted by the ryots and villagers, it is probable that considerable improvements will be effected in them in course of time by engineers or by others of an inventive turn of mind.

The fibre can also he extracted by scraping the plantain strips with a bamboo scraper on a hard smooth board 5' x 6" x 2" precisely in the same way as agave fibre is occasionally extracted from the fresh leaves of the plant by the villagers in the Coimbatore District.*

SUGGESTIONS.

There can be no question as to the vast numbers of plantain stems that are available in this country; and it would be a good thing if even a tithe of the enormous quantity of fibre which could be obtained from them could be turned to account. The following suggestions are accordingly put forward as been likely, if adopted, to encourage the establishing of an industry in the extraction and utilisation of plantain fibre:—

(1) That the professional fibre-cleaners and ryots be visited in their villages and that practical demonstrations be given to them, as well as to the pupils o

* *Vide* Bulletin No. 30 "Extraction of *Agave Americana* fibre at Coimbatore."

industrial schools, by trained men in extracting plantain fibre by means of No. 1 machine.

(2) That machines be supplied at practically cost price to those who may wish to buy them.

(3) That competitions be subsequently organised in districts or centres where plantains are largely grown, at which prizes should be offered to the most expert hands in extracting plantain fibre by means of No. 1 machine and also for the best samples of cordage made of the fibre.

(4) That merchants likely to purchase the fibre if it were obtainable in quantity be encouraged to attend such competitions so that producers and purchasers may be brought together in order that a demand for the fibre may if possible be created.

If any real encouragement is to be given for the purpose of introducing the industry among the Indian villagers no half-hearted measures will be productive of much good. It is, therefore, advisable that whatever it is decided to do in furtherance of the scheme should be carefully planned properly directed, and perseveringly carried out in a thorough manner till such time as definite and reliable results are ascertained.

As has already been stated, the fibre obtained from the common plantain is not so strong as that which is obtained from *Musa textilis* the 'Manilla Hemp' of commerce, and it will not therefore fetch anything like the price of the latter. It can, therefore, never compete favourably with 'Manilla Hemp' in the European markets. But, once the natives of India take to extracting and utilising the fibre of the common plantain it is almost a foregone conclusion that an industry in the much more valuable fibre of *Musa textilis** would follow in course of time.

In conclusion, the industry in extracting fibre for cordage from plantain stems after they have each borne their bunch of fruit is more certain to be of local interest and of benefit to the Indian cultivators than it is ever likely to attain any importance as an article of export.

A NEW APPLICATION FOR RAMIE FIBRE.

It has been the fate of Ramie or China grassfibre to have alternately long periods of a smouldering existence and then to burst into a flame of popularity This has been going on for the last hundred years, and notwithstanding that, there can be no doubt as to the value of the fibre, and to its adaptability to a great variety of uses, Ramie cannot yet be included amongst commercial fibres. Quite recently notice have appeared in the *Lancet* and other publications on the application of the fibre for the manufacture of under clothing, a factory having been set up at Carlskrona, in Sweden, special for this purpose. Ramie underclothing is said to be superior to wool, cotton, linen, or silk; further, that it is more durable, is unalterable in its texture, does not shrink, and its properties are unchanged in spite of wear and washing. The fabrics which we have seen are certainly well made, one pattern in particular being so open and withal strong that though the thread itself is not elastic, the meshlike structure makes the material quite elastic—a property that is said to be retained permanently. In consequence of these characters many advantages over other materials are claimed for it, namely, that it does not hinder perspiration but facilitates it and secures complete ventilation, receiving warmth from and returning it to the skin; further, that it is cooling during oppressive heat, and warming in cold weather; and above all, that it 'prevents the germination of diseases. of the skin, rheumatism, &c.' Though the manufacturers are introducing it exclusively for underclothing and hosiery, some of the patterns would seem to have recommendations for ladies' blouses or summer dresses, the pattern being of an open or network character, would look well over a dress of a bright colour. With the view of furthering the use of Ramie we may perhaps say that the English agents for these materials are Messrs. Hall, Nilsen & Co., 47 Mosley Street, Manchester, *John R. Jackson, Claremont Lympstone, Devon,—The Gardeners' Chronicle.*

* The manilla Hemp was successfully cultivated at the Saidapet Farm in 1882-84 and fibre extracted therefrom by scraping the sheaths with a blunt knife by hand. The stems yielded 1 to 2½ per cent. of their weight of fibre. A rope of Manilla Hemp, ½ inch thick sustained a weight of about 500 lb. The cost of extracting fibre by *hand* was of course excessive—C.K.S.

A native gentleman of Valovanur, South Arcot named Venkataramier, states that a specimen of common plaintain fibre has been valued in London at from £25 to £35 per ton. He estimates the production of clean fibre at 1¾ lb. per stem or nearly one ton per acre, and the cost of extracting the fibre by manual labour at R55 and the charges for bailing. transport, freight etc., at R 45. Large profits are possible, if these figures are correct. Certain experiments made at the Saidapet Farm in 1882-83 in extracting fibre from the ordinary plantains showed that the average weight of a plantain stem was hardly 40 lb. and gave not more than 3 per cent. of fibre. The matter is well worth further attention.—C.K.S.

A PLAGUE OF RATS.

Mr. E. E. Fernandez in the May 1902 number of the *Indian Forester* gives an interesting extract from the diary of an Extra-Assistant Conservator regarding damage to trees by rats. Similar damage has been found by me in the Jhalod and Godhra oranges of the Panch Mahals district. The rats here have, however, confined themselves to eating teak bark, gnawing down to the wood. In rare cases they have attacked bamboos; however, where such instances were found I noticed the stem was never nibbled clean through, but only one side attacked; also that the stem was rarely attacked at the butt, but two or three feet up the stem. I so far have found no case in which *Butea frondosa* was damaged. These rats first were reported in June 1901 and soon after that time efforts were made to exterminate them, rewards being offered for every 100 killed. Though about half a million were killed and brought in for reward in the Jhalod range alone, it had little effect in stopping the damage they were doing to crops. They cleared off the best portion of the crops in four out of five of the ranges of this division, causing severe distress throughout the affected areas. They were extremely objectionable in camp, running over and through the tents, especially at night; this one could put up with, had they not at the same time eaten ones boots, carpet and especially every sort of provision not kept in a tin-lined box. These were not the only troubles they gave the public in general; walking became difficult in places owing to one sinking into their holes at every other step, and riding across country became nearly out of the question. About the 1st February 1902 they were noticed to be on the decrease. by the 15th it was only on rare occasions you saw them, and by the end of the month they had completely disappeared. The only thing that can be hoped is that we will be spared from them next year.

R. S. P.

CAMP SULIAT, PANCH MAHALS,

7th May 1902.

—*Indian Forester.*

PUSSELLAWA PLANTERS' ASSOCIATON

REPORT FOR 1902.

Your Committee beg to submit to you the tenth annual Report.

MEMBERSHIP.—The number of estates on the Register is fifty. During the year *one* estate has withdrawn and three have joined the Association. There is one private subscription.

FINANCES.—The balance at credit of the Association is R199·41, as compared with R249·99 in 1902.

MEETINGS.—Three general and three committee meetings have been held during the year, at which the average attendance was good.

CROP ESTIMATE FOR 1903.—Acreage in bearing, 21,042; Total crop (Black), 9,555,550; Green tea, 215,000; Native leaf (M.T.), 1,653,500; Native holdings, 5,000; Yield per acre, 438 lbs per acre; Total crops as against 1902, 11,424,050; Acreage in bearing including native, 25,305; Total crop, 11,248,200; Green tea, Nil; Yield per acre, 443 lb. Fifty acres have been returned as abandoned during the past year.

SEASON.—The latter half of the past year has been generally unfavourable for flushing, especially in the higher portions of the district, owing to the unusually continuous and heavy rains of the North-east monsoon. Estimates in many cases, have not been fully realised.

LABOUR.—Labour has been fairly plentiful, but advances show a tendency to increase, and your Committee regrets that the sub-Committee appointed by the Parent Association to consider the Labour question, could not see its way to recommend any alteration in the present laws affecting the relations of employers and employed.

ROADS.—The main and minor Roads in the District have been maintained in good order during the year, and the thanks of the Association are due to the Provincial Road Committee for the grants given towards the up-keep of the latter, and to those members who undertake the supervision of the repairs. The new grant-in-aid cart-road between Ulapane and Riverside has been connected during the past year and is making fair progress.

TOLLS.—The deputation appointed to ask for the abolition of the Gampola Bridge toll was received by His Excellency the Lieut.-Governor in the absence of Sir Joseph West Ridgeway, and the latest advice from the Colonial Secretary (dated 5th December, 1902) is that the matter is still under the consideration of Government.

Your Committee trusts that the final result will be to release the District from a portion of the heavy tax levied on it at present in the form of tolls.

BLIGHTS AND PESTS.—The district has been remarkably free from "Grey Blight, or Rust" during the past year; but your Committee regrets that the "Shot-Hole-Borer" is still very prevalent on some estates, and appears to be spreading. Burning prunings has been tried, but does not seem to have been of much use; at present prunings are being buried with Basic Slag, but it is too early yet to form any opinion as to what this will effect. Helopeltis was noticed on two or three estates round Gampola, but it disappeared without doing any harm.

OBITUARY.—Your Committee desires to express its deep regret at the sudden death of Mr Shelton Agar, an old and valued member of the Association.

(Signed) TOM, HYATT, Hon. Secretary, P.P.A.

		R.
To	balance taken over from Mr Fred Wernham on May 10th, 1902, in Bank	316·39
Do	Five members subscriptions at R12	60 00
Do	Overpaid by one subscription ..	50
Do	Kachcheri order from Chairman, District Road Committee	930·00
Do	Kachcheri order from Chairman, District Road Committee, Kegalla ..	50 00
Do	Kachcheri order from Chairman, District Road Committee, Nuwara Eliya	100·00
		1,456·89
January 1st to Balance	.. ..	1,456·89
By	Paid Alex. Philip 5 estates subscriptions to Parent Association at R7·50	37·50
Do	Cheque donation to G W Sturgess, Hony. Secretary Society for Cruelty to Animals	10·00
Do	Cheque to Alxe. Wardrop for donation to Victoria Memorial Eye Institute..	50·00
Do	District Road Grants	1,080·00
Do	Stationary, Advertising Clerk, Petties and Postages	79·98
Do	Balance at 31 December, 1902, as per Bank, book at credit of Association..	199·41
	Total ..	1,456·89

RAKWANA PLANTERS' ASSOCIATION

ANNUAL REPORT FOR THE YEAR 1902.

Your Committee have pleasure in presenting their report for the year 1902.

OBITUARY.—Before passing on to the various items of the report, your Committee consider it their duty to record their deep feelings of sorrow at the irreparable loss sustained by the District of Rakwana in the death of Mr Robert Bartrum, of Stubton, which sad event occurred on the 25th September last.

The late Mr Bartrum, who was one of the oldest residents in this district, and one of the staunchest supporters of this Association, will long be missed by his fellow-planters of Rakwana.

REGISTER OF ESTATES.—The number of estates on the roll of the Association for the past year was fifteen (15,) which was an increase of two on that for the year 1901.

NUMBER OF MEETINGS.—There have been four General, and five Committee meetings held during the past year, all of which have been very well attended. The amount of business transacted has been considerable, and the wants of the district have been kept prominently before the Government, with the result that, in nearly every instance, they have been promptly attended to.

OFFICIAL ESTIMATE OF TEA CROP FOR 1903.—The estimate of tea crop for this year is 40,000 lbs. in excess of the estimate for 1902, in spite of a considerable acreage having been abandoned. The acreage to come into bearing is, however, next to nothing, being only 28 acres.

DISTRICT ROADS.—Your Committee have to inform you that all the minor roads in the district, in charge of the Association, have been repaired for the past year, and are in order. An additional vote of R100 was obtained for the Springwood-Elchico road, bringing up the Government moiety to R300. A vote of R67 was also obtained from the District Road Committee for repairing the Stubton Ford, the estates interested contributing a further sum of R33, bringing the amount up to R100. This work has been greatly hindered by wet weather, but is now nearing completion. Your Committee are also pleased to record that the District Road Committee have voted the sum of R335 for the re-construction and repair of all the bridges requiring attention on the Rakwana-Depedene road. The Superintendent of Depedene estate has been entrusted with this work. The lower section of the Rakwana-Bulatota road, from the Rakwana-ganga bridge to the turn-off to the Government bungalow has been, at the request of this Association, takeover by the Public Works Department from 1st January of last year.

GOVERNMENT CART ROAD.—Your Committee are pleased to note that the Government cart road through the district has been maintaind in a due state of efficiency during the past year.

MADAMPA PASS DEVIATION.—Your Committee are somewhat disappointed with the progress already made in connection with this much-needed deviation—only one mile of the road having been made ready for traffic during the year 1902, besides about ¾ of a mile more of earthwork completed. Your Committee hope that now, the most difficult por-

tion of the road having been constructed, more speedy progress will be made with the remaining section, where the work to be done is comparatively easy; and that the entire road will be open for traffic before the close of the present year.

The officials concerned are to be congratulated on the excellent construction of the first completed mile.

GOVERNMENT BUILDINGS.—A palatial set of pioneer lines and an overseer's bungalow have been erected on the Government reserve in Stubton estate. Your Committee fear that this work has been done somewhat at the expense of that section of the cart-road above the Bulatota Pass, which is to be *gravelled* instead of *metalled* from 1st January, 1903.

A new Post Office of ornate and substantial appearance has been built in Rakwana during the past year, and great credit is due to the Provincial Engineer for the expeditious way in which the work has been carried out.

RAKWANA HOSPITAL.—The addition to the female ward was completed and opened during the past year, and is found of great use and benefit.

Dr. Wm. C Pieris, the late D. M. O., left the district early in the year, and was succeeded by Dr. T Ohlmus as Medical Officer at the Rakwana Hospital.

GODAKAWELA FIELD HOSPITAL.—Your Committee regret to state that there appears to be an inclination on the part of Government to close the above hospital and to transfer its patients—mostly cases of "parangi" and malarial fever—to the District Hospital at Rakwana, where it is proposed to erect two separate wards for the treatment of "parangi" cases.

Your Committee have protested strongly against this proposal, and will continue to do so, until Government see the advisability of giving up the idea, and continuing to, either keep up the present Field Hospital at Godakawela, or to build the proposed two new wards at Palawela, which is far more centrally situated.

ANNUAL CERTIFICATE:—FACTORY MACHINERY INSPECTION.—Your Committee regret to inform you that no definite reply as yet been received from Government to the resolution on above subject passed at the general meeting of this Association held on July 5th, 1902, which resolution was sent in to Government on the 21st July last. All the reply vouchsafed up to the present has been that "the revision of the new rules" was still "under the consideration of Government."

RAILWAY EXTENSION TO RATNAPURA.—Your Committee have much pleasure in informing you that the sum of R25,000 has been voted in the Supply Bill of 1903 for the survey of the proposed extension of the Kelani Valley Railway to Ratnapura. The surveyors are already at work, and it is reasonable to suppose that the survey will be completed in about eight months from now, which will be about the time that the last section of the Kelani Valley Railway will be opened to Yatiyantota, so that no delay should take place in moving the plant and engineering and working staff on to the new extension. Your Committee think it would be a graceful act on the part of His Excellency the Governor, and the crowning point to his hitherto uniform progressive policy, to announce to us before he leaves the island towards the end of this year that the Ratnapura Railway has been sanctioned, and will shortly be commenced.

COLOMBO-RAKWANA AND BALANGODA MAIL SERVICE.—Your Committee consider that the thanks of this Association are due to the Postmaster-General for so promptly acceding to their wishes in providing the two districts with a through mail and passenger service to and from Colombo in the one day.

The discontinuance of the Sunday coach, however, is felt to be a great deprivation and inconvenience, but it is hoped that steps will soon be taken to have it reinstated.

KELANI VALLEY RAILWAY TIME-TABLE.—Your Committee regret that no alteration has as yet been made in the above time-table, in order to enable the coach to leave Avissawella and arrive at Rakwana at an earlier hour than it does at present, and to also obviate the necessity of the return coach leaving Rakwana at such an early hour as 5 a.m.

Your Committee intend to continue to press the matter, and are in hopes that the General Manager will be induced, before long, to make the required slight alteration in the present Railway time-table.

APPOINTMENT OF RESIDENT HEADMAN AT THE VILLAGE OF ITTAKANDE.—Your Committee are pleased to inform you that, at the request of this Association, Government were pleased to appoint a Resident Peace Officer to the village of Ittakande—a very desirable and necessary appointment.

LABOUR SUPPLY.—Your Committee are of opinion that the labour supply of the district is totally inadequate to present requirements, and regret to note that coolies are not coming in from the Coast as in former years.

There appears to be a tendency on the part of planters to draw their supplies from other estates, and there are some Companies who are still giving out unlimited advances, which tends to demoralise labour, and to discourage legitimate recruiting from the Coast.

ADVANCES.—Your Committee regret that, owing to the scarcity of labour from the Coast, advances have shown an upward tendency, but that, compared with some other districts, the average rate per head is fairly moderate.

TIN-TICKET SYSTEM.—Your Committee are of opinion that this system is not workable in a district like Rakwana, which is 54 miles from the nearest railway station. When the railway is extended to Ratnapura there will be some chance of the system finding favour in this district.

WEATHER.—The past year has been an abnormally wet one, and most estates in the district are, in consequence, short of their estimates.

HEALTH.—The general health of the coolies in the district has been fair, and the mortality normal, and there has been a complete immunity from all serious epidemic diseases.

HELOPELTIS.—It is much to be regretted that this pest has proved very rampant throughout the district during the past year, and that it appears to be increasing in virulence year by year.

RICE.—Rates of rice throughout the year under review, though somewhat high, have been unusually even. The monthly rates laid down by this Association have been adhered to, and accepted by the Chetties.

CART HIRE.—The rates of cart hire to and from Colombo remain the same.

ACCOUNTS FOR 1902.—The accounts for the past year have been submitted by the Honorary Secretary, and your Committee are pleased to inform you that the balance standing at the credit of the Association on the 31st December, 1902, is R177·05.

OUTLOOK FOR THE NEW YEAR.—Your Committee are gratified to note the better tone apparent in the tea market, and are confident that, if the warning note *re coarse plucking* lately sounded by the Tea and Produce Committee of the Ceylon Association in London, is heeded by all those concerned—especially Colombo Agents and V. A.'s—a bright future should be in store for the industry.

The increased manufacture of green teas being another factor towards enhancing the value of blacks, and thus restoring the industry to its former position, should be strenuously encouraged.

Your Committee, therefore, consider that Government ought to be asked to come to the rescue in providing the "Thirty Committee" with sufficient funds to make up the deficit in the green tea bonus of 1903—a step which would not only directly help on the planting enterprise, but which would also prove indirectly beneficial to the Colony at large.

DIKOYA PLANTERS ASSOCIATION.

REPORT FOR 1902.

MEMBERSHIP.—There are 79 members on the roll, 75 estates and 4 private subscribers, as against 80 members last year, one estate having withdrawn, being one of a group whose interests are already represented.

FINANCE.—Your Committee are glad to be able to report that the finances are in a satisfactory condition, all outstandings having been paid, and a sum of R7·90 is in hand, as against a debit balance of R57·82 at the end of last year.

The accounts have been audited by Mr Hamlin and certified as correct.

LABOUR.—Whilst as a whole the District has been sufficiently supplied, your Committee would strongly urge on its members, in view of the shortage which undoubtedly exists, the desirability of recruiting fresh labour from the coast, and not relying on their neighbours for their requirements.

LABOUR FEDERATION.—During the year two Committee meetings and one General meeting have been held. The Committee had some serious differences of opinion to arbitrate on, and are glad to say that in each case the parties concerned agreed to abide by the decision of the Committee, which course is to be strongly recommended. A scheme for Local Federation was brought forward and was fairly well supported, but as the required support of 75 per cent of the acreage was not obtained, it fell through.

HOSPITAL.—Your Committee regret that, notwithstanding the urgent claims this District has for a new hospital, during the year under review no steps have been taken to rectify this most unsatisfactory state of affairs, beyond surveying a site for the proposed New Building. It is, however, with satisfaction that your Committee are able to report that the hospital was personally inspected by His Excellency the Governor on January 20th, 1903, who is now fully alive to the pressing need there is of at once taking in hand this most important work. The thanks of the Association are due to His Excellency for giving this matter his personal attention, and it is to be earnestly hoped that before long the District will be in possession of a hospital not only suitable for the purpose it is intended for, but worthy of the requirements of the District.

TIN TICKET SYSTEM AND REGISTRATION OF ESTATES.—This has been working satisfactorily during the year, and, with the few minor improvements in details now being made, will prove to be a still greater boon to Planters. Your Committee would urge all members of the Association to give the system a thorough and careful trial. The registration of estates is now compulsory, whether estates avail themselves of the scheme or not.

DISTRICT AND MINOR ROADS.—The main roads are in good order, having been much improved by widening the bad corners and narrow portions. A sum of R900 has been received and distributed on minor roads which have all been well kept up.

RAILWAY MATTERS.—The improvement—more especially in the Goods Department—which was hoped for in our last annual report, has not been noticeable. Hatton station is however, being nlarged, and is better regulated.

HATTON POLICE MAGISTRATE.—During the year the Government was petitioned to relieve the Magistrate of his work at Nuwara Eliya and Nawalapitiya. The Dimbula, Maskeliya and Ambegamuwa Planters' Associations supported this Association, and Government has now relieved the Magistrate of his Nawalapitiya work, which should lead to less delay in dealing with cases.

POLICE.—The Police appear to have generally done their work both well and efficiently, and it is worthy of comment, that since the establishment of a Guard-room at Kotiyagala, petty thefts, such as fowl-lifting, etc., have practically ceased.

PESTS AND DISEASES.—Your Committee are glad to report that on the whole the District has been free from any serious outbreak of either

NURSING ASSOCIATION.—A scheme by which Superintendents and Assistant Superintendents of estates can now receive the full benefits of the Association, by estates subscribing a reduced sum to the funds, has lately come into forces Your Committee would commend this scheme to all Proprietors and Agents of estates, for whilst by joining they would assist in putting the Nursing Association of Ceylon on a sound financial basis, they would also at the same time provide for the efficient nursing of their Superintendents in time of sickness.

OFFICIAL CROP ESTIMATE.—The returns have been received from all estates except 9 for which au average based on previous returns has been struck. The figures are as follows:—Total tea 29,329 acres; tea in bearing 28,611 acres; estimated crop 13,022,450 lb. This gives an average of 455 lb. an acre, against 465 lb. last year. Your Committee are of opinion that last year's estimate of 13,000,000 lb. owing to the abnormal season was not realised.

OBITUARY.—Your Committee regret the losses to the District caused by the deaths of Messrs R H Tennant and John Fyler.

STATEMENT OF ACCOUNTS.

EXPENDITURE.—To accounts paid on account, 1901, R61·86; 79 subscriptions at R7·50 paid A. Philip, R592·50; clerk for 12 months, R120; advertising R61·78; rent of room, R75; labour federation expenses, R5·25; postages, R36; stationery, R15; telegrams, R1·70; cheque book, commission, etc., R14·55. Total R983 64. Balance in hand R7·90. Grand total R991·54. *District Road Account.*—To amount spent on roads R833; balance in hand R67.—Total R900.

RECEIPTS.—By amount brought forward R4·04; 75 estate subscriptions at R12/50, R937·50 and 4 private subscriptions at R12/50, R50, R987·50. Grand total R991·54. *District Road Account.*—By amount of vote R900.—Total R900.

By amount carried forward as per Bank passbook, R74.90.

"OOLONGS" TEA—AND THEIR MANUFACTURE.

Having sent a copy of the pamphlet concerning Formosa Oolongs to Mr. Fairhurst, he is good enough to write to us as follows:—"I only saw it (the pamphlet) on the morning of the Dimbula Planters' Association meeting when it was too late to alter my paper. I do not suppose that anyone in Ceylon has tried the process indicated in the

pamphlet, and I should imagine that there would be difficulty in so doing and great loss of time, an article of which the Chinese take little account. As the crop of Oolongs in Formosa and China is gathered only three or four times during the season—the bushes yielding nothing in the winter, the loss of time is of far less consideration there than it would be in Ceylon where the gathering of the crop would be continuous. As I said in my remarks—I do not think that Ceylon can successfully imitate the Formosa Oolongs; but I think it can do so as regards the Foochow Oolongs. But as Foochow can largely increase its production of Oolongs, I doubt whether the average price, which Ceylon might expect for its manufacture of them, would be good enough to induce estate to make them. And I also doubt whether Oolongs made by machinery would compete successfully with those made by hand—that, however, remains to be proved and is, I think, worth trying. Since reading my paper I have seen a sample of green tea (young hyson) which, I consider, is an excellent tea, and which is an exact imitation in make, liquor, and aroma, of the China article and will, I think, certainly pay well."

"GOOD CULTIVATION AND DISEASE."

Mr. Carruthers writes with reference to the following paper as follows:—

"A few notes I have jotted down when reading Marshall Ward's recent paper on most interesting experiments with rust on Brome grass—perhaps the *T.A.* would like the *MS.* I want to kill the idea of 'feed up your plants and no disease will come' which makes men allow insects and fungi to go on unhindered."

A recent paper by Professor Marshall Ward, describing the results of some experiments on the relations between some species of grass belonging to the genus Bromus and the rust fungus *Puccinia dispersa* which attacks these grasses, is of wider interest because it throws additional light on the question of predisposition of plants to disease. A belief is very general among horticulturists and agriculturists both in Europe and the tropics that most, if not all, diseases of plants can be avoided by keeping the plants well nourished. This is, of course, true of diseases due to unhealthy conditions. Such diseases as come from starvation, freezing, excess of sun, excess of water, &c., &c., will be prevented if these conditions are not allowed to exist: but these are not the diseases that the farmer and planter most fears. He fears most those of which he does not understand the exact cause; and as he knows well the causes of the evils just mentioned and the way to prevent them he is not troubled, and proceeds to prevent and cure them by giving his plant healthy conditions and plenty of food.

The fact the planter has learned by experience—that by keeping his plants in a high state of health he wards off these "environmental" or "physical cause" diseases—has unfortunately led him to believe that in other diseases, caused by the attacks of specific organisms such as insects, fungi, or bacteria, feeding the plant and giving it healthy conditions, will be of use. While there can be no harm in carrying out this treatment, yet if these are the only measures taken against such diseases as finger and toe, cacao canker, rust in wheat or any other such disease, the effect can only be to prolong the struggle without altering the final result, just as to feed up an animal suffering from the attacks of internal parasites, without removing the cause of the illness, would only bring a temporary appearance of health, if even that. Professor Ward's experiments consisted in starving some of the Brome plants by various methods—chiefly mineral starvation—and by keeping another series in a vigorous state of health by ample nutrition. The plants showed the effects most plainly in their reduced root system, narrow and pale-coloured leaves, and stunted growth, their lack of health. When, however, the healthy and unhealthy plants were both submitted to similar infection of the rust fungus, the fungus grew equally on both strong and weak plants. The starved ones did not, as might be supposed, afford too little food for the fungus and thus be immune to attack, neither did they, as the practical man's belief often leads him to think, fall an easier prey than the well-fed plants. And still further it was found that though the size and quantity of the fungus on the starved grasses was less than on the healthy ones, owing to their obtaining less food, yet the spores formed by the fungus from the weak plants were equally virulent in their capacity of infecting other plants.

The moral of this and much other scientific work on plant pathology is that the motto of the planter should be—not: Keep your plants well fed and tended, to prevent disease—but: Keep your plants well-fed and tended, *in sanitary conditions, and remove chances of infection*—to prevent disease.

J. B. Carruthers.

THE GOLD COAST COLONY.

The official report on the Gold Coast Colony for the year 1901 has been issued as a Parliamentary paper in the series of Colonial Reports [Cd. 788-45]. The revenue from ordinary sources amounted to £471,193 3s. In addition to this must be reckoned grants in aid of £25,000 for the Northern Territories and £197,700 for the Ashanti disturbances. The net increase in the general revenue, exclusive of grants in aid, over the revenue of 1900 was £138,340 19s. Under the head of Customs there was an increase of £68,264 5s 11d, this being attributable to the marked expansion of the colony's import trade. There was a falling-off of £411 15s 5d in the revenue from the Northern Territories which is ascribed to the stoppage of the caravan trade with Ashanti and the failure to obtain the annual supply of trade goods owing to the Ashanti rebellion. There was a total increased expenditure of £110,847 8s 10d; the expenditure on the Ashanti disturbances during the year was £124,392 5s 2d. The Government loan for the Ashanti war, received partly in 1900 and partly in 1901; was £400,000. The total value of exports and imports combined amounted in 1901 to £2,360,760, the highest figure yet reached except in 1899. But whereas in the last few years imports and exports have shown a more or less equal proportion of value, the large total for 1901 is

entirely due to imports, as the exports have shown a conspicuous decline. The United Kingdom claimed 73½ per cent of the imports, and 45 per cent of exports; Germany 10½ per cent of imports 26 per cent of exports and the United States 5¾ per cent of imports and four per cent of exports. Rubber exports showed a marked decrease (224,126) in 1901, which was due in part to the low prices on the European markets and in part to wasteful handling of the rubber vines; with care and attention there is every hope that the rubber trade may revive and its values and quantities regain the standard of former years. Palm-oil and palm-kernels, the other two staple articles of export, also showed a decrease, and the trade in kola-nuts still manifests signs of having been severely affected by the Ashanti rebellion in 1900. Cocoa is the only article of export which showed an increase for 1901, and this amounted to £15,537 in value. A further increase is confidently expected for the current year.—London *Times*, Jan. 1

PLANTING IN DOMINICA.

[TO THE EDITOR OF THE "TIMES."]

Sir,—Two years ago you were so good as to give publication to a letter from me in which I attempted to indicate the advantages offered by the island of Dominica for the profitable investment of moderate capital. Thanks to the kind assistance thus given by you, the island obtained an advertisement from which it has considerably benefited. Over 100 persons, possessing the requisite means, placed themselves in communication with me; and a good number of young men have since gone out to Dominica and have become planters there. I am happy to be able to state that with one exception, who "threw up the sponge," they are all doing very well and appear to be entirely satisfied with their prospects. Several have taken up considerable blocks of the Crown lands, and they are rapidly transforming areas of primeval forest into promising plantations of cocoa, limes, oranges, and rubber. They have already got through the rough part of their work, and are settled in smart cottages and bungalows where the amenities of a decent mode of living are very apparent.

THE NEW ROADS

recently constructed into the mountains and valleys the interior have opened up and rendered accessible many thousands of acres of splendid lands, and there is still room in Dominica for scores of the right kind of men. For the benefit of those who may not have seen the communication which appeared in your issue of September, 1900, I beg that you will allow me to recapitulate, as concisely as I can, a few of the special advantages which are offered by the colony which we are now trying to develop.

THE CLIMATE IS EXCELLENT,

and especially suited to persons who have a tendency towards pulmonary affections. Yellow fever is unknown and malaria very rare. The districts bordering on the leeward coast of the island are rather warm in summer, but in the mountains of the interior and on the windward coast the temperature all the year round is delightful. While it is exceedingly difficult to purchase a plantation already yielding crops of cocoa or limes, there are over a hundred thousand acres of very fertile land in the possession of the Crown which can be purchased for 10s an acre with facilities for payment. There is, at present, no tax on land, and other imposts are very light. There is a good supply of labour at rates varying from 8d to 1s 2d a day, and the population is steadily increasing. The rainfall is abundant and a great number of streams afford water power.

THE FARE TO DOMINICA

by the Royal Mail Company's boats costs £25, return ticket £40 and the journey takes 13 days. There are several other lines of steamers calling at the island and it has frequent communication with the United Kingdom and with America. There is an open market for all the local products, and the trade of Dominica has doubled itself in the last six years. Some idea of the recent extension of agriculture may be obtained from the fact that during last year over 60,000 seedling plants of cocoa, limes, oranges, rubber, vanilla and other products were distributed to planters from the nurseries in the Botanic Station. All these plants were sold below the cost of production, and the Imperial Department of Agriculture is always ready to give advice and assistance to any planter requiring it. The island is now in a sound financial condition, and means have been found to carry out a number of works of public utility. An excellent steamer plies constantly round the coasts; new roads have been made in many directions, and the old ones put in fair order; bridges are being built over the largest rivers, and telephone lines are being extended round the island. A good public library was built and opened last year as a memorial to her late Majesty, and a social club has just been established in Roseau.

THE VALUE OF PROPERTY

is increasing rapidly, and there is every prospect of further improvement. A long period of depression is being succeeded by an era of prosperity; and, instead of that feeling of discouragement which exists in those West Indian islands where sugar is the staple industry, we find in Dominica a cheery and sanguine spirit ready to give cordial encouragement to every scheme that gives promise of working for the good of the island. Owing to its excellent climate, abundant rainfall, fertile soil, and other natural assets, Dominica offers advantages for tropical agriculture which are rarely found combined elsewhere. To men of independent spirit the life of a planter has many attractions, and it is generally conceded by all who know the place that, if its possibilities were more generally known in England, all the unoccupied land now available would very quickly be taken up. To the tourist the island is a source of unalloyed pleasure. It is undoubtedly the most beautiful of all the Antilles. Considering the size of Dominica—about 300 square miles—the scenery is remarkably grand and imposing. The rivers and streams are full of waterfalls and cascades; the mountain sides are clothed with the richest vegetation; luxuriant groves of tree ferns struggle with a variety of palms for the mastery of the soil; and altogether the island is a veritable mine of beauty.

I may add that Dominica has been

ABSOLUTELY UNAFFECTED BY THE RECENT VOLCANIC DISTURBANCES

in Martinique and St. Vincent; and competent scientific authorities have recently expressed the opinion that little or no danger need be feared on this score. If any of your readers care to make further inquiries into the subject of Dominica with a view to becoming planters there, I shall be happy to reply to any inquiries that may be addressed to me, care of Messrs. Grindlay and Co., of 54, Parliament-street, S.W. I would not, however, advise any one to entertain the project of becoming a planter unless he can dispose of a *minimum* capital of £1,500. With many thanks for the space you have been good enough to accord me.—I am,

H. HESKETH BELL, Administrator of Dominica.
December 29.
—London *Times*, Jan. 3.

AN OIL BURNER.

Speaking of the oil burner patented by Mr. Allan Renny, of Penang, our northern contemporary says:—

The question of oil fuel is one which for a considerable period has occupied, and continues to occupy, the attention of locomotive and marine

engineers, ship building firms, and indeed steam users generally. Various forms of burners have been placed on the market, and though considerable efficiency has resulted, there is no reason for believing that finality or anything approaching it has yet been reached. To obtain the fullest advantage which liquid fuel possesses over solid fuels it is important that the burner should provide means for the complete combustion of the oil, and thus avoid the deposit of a solid residue. Mr. Renny claims for his invention that it affords a simple means for the more efficient and economical combustion of liquid fuel for the production of steam, for smelting and for other purposes, and that it overcomes many of the objections attached to oil fuel burners as hitherto constructed. The apparatus consists of a casing fitted with an oil inlet and having two internal diameters with two nozzles attached, one being fitted within the other and forming with the outer casing passages for air, steam, and oil. If necessary it may be worked by air pressure instead of steam, though the latter is stated to be the more economical. We understand that Mr H Cowdell, of the Cradley Heath Boiler Works, Staffordshire, is the English agent for this burner, and that applications have been received from several important firms for permission to adopt it. Under these circumstances there is not the least doubt that the burner will receive the fullest trial, and we trust these trials will bear out the satisfactory results which were obtained during the experiments carried out in this Settlement.—*S F Press*, Jan 21.

THE ANOPHELES MOSQUITO.

A Reuter telegram from Liverpool, dated January 9, says :—" A letter has been received by the hon. secretary of the Liverpool School of Tropical Medicine from the leader of the Sierra Leone expedition of the school, Dr. Logan Taylor (who has been sent on an expedition to the Gold Coast by the school), with reference to the progress of the expedition in Sierra Leone. Dr. Logan Taylor says :—' I am getting a report ready for the school about the Sierra Leone work and will let you have it soon. We had to stop most of the men at the end of August, only keeping on the oiling gang after that. I am well pleased with the work this gang has been doing during my absence, as when I went round to inspect their work I found both in untouched and drained streets a very noticeable absence of anopheles larvæ in places where we used to be able to get any number. This is due, of course, to their not being able to breed owing to the pools being either swept out or oiled regularly. The result of this is, that, compared with the corresponding time last year, in some of the notoriously bad streets, where in a single house we could find as many as six, seven, or a dozen anopheles mosquitoes in the early morning, this year with great difficulty, after searching house after house, we could get one, or perhaps two, adult insects. I can keep on an oiling gang of men and the headman Shaw until the end of February or so, by which time I should be free of the Gold Coast, and am leaving 11 men to peg away at Grassfields District until I return to Freetown. An extra £500 has been put down in next year's estimates for continuing drainage work. The engineers are working at the hill railway, and also at the new waterworks. I may say that since the men of the Liverpool School expedition stopped clearing up yards and emptying out the water containing culex larvæ no one else has taken up the work, and these insects are getting bad again; in fact, the rubbish is beginning to accumulate in the yards just as before, and several of the Europeans were complaining to me of being much annoyed by culex and stegomyia. This means that, unless the Government or the school will keep on the work, the money the school has spent on it will be almost thrown away. My destination now is Cape Coast, where I am to go and take charge of the sanitary work of the town and see that my former recommendations are carried out. The people at Accra have been very kind, and the principal medical officer and the medical department are doing everything to assist me.' "—London *Times*, Jan. 10.

RUBBER PLANTING IN TENASSERIM.

The Rubber Planting experiments in the Tenasserim division by the Forest Department have been continued on an extended scale, 772 acres of land having been cleared and 663 planted with *Hevea* during the past year. The area of the experimental garden has been extended by some 42 acres, and the Kambe rubber plantation, Rangoon, has been taken over by the Forest Department from the Cantonment Committee.—*Madras Mail*, Feb. 4.

"DE INDISCHE MERCUUR."

This excellent and ably edited agricultural and commercial weekly, published by Mr. J. H. de Bussy of Amsterdam, has attained its twenty-fifth birthday, which has been commemorated by the issue of a special number, with an artistic cover, containing a number of contributions by well-known Dutch writers on agriculture with facsimiles of their signatures, a history of the "Indische Mercuur" by Mr. de Bussy, &c., &c., and numerous illustrations. Among the papers is a reprint of the *in memoriam* notice, by Mr. F. W. Van Eeden, of Mr. J. C. B. Moens, formerly the director of the Government cinchona plantations in Java, who died in 1886, and who once paid a visit to Ceylon. We congratulate our contemporary on having reached the quarter-century of its existence, and wish the "Indische Mercuur" a long career of usefulness.

UDAPUSSELLAWA PLANTERS' ASSOCIATION.

REPORT FOR 1902.

P. A. MEETING.—There has been four general meetings held during the year and which have been fairly well attended, the average attendance being about 14, the number of estates on list is 26, being same as last year.

FUNDS.—The funds of the Association are in a satisfactory condition.

TEA.—The yield for the year has been a fairly average one, though there has been a falling off during the past three months. The district prices have been well maintained and have on several occasions shown stand out prices.

ROADS.—The main road during the past year has been kept in very fair order, considering the railway works are being carried on and credit is due to those

in charge for having kept the road open at all times.

MINOR ROADS.—Generally are in good order.

POSTAL.—It is to be hoped that Government will give the District a Post and Telegraph office at Ragalla when the railway reaches this point.

LIGHT RAILWAY.—Beyond a certain amount of earth cutting little has been done during the past year, and this Association hope to see more rapid progress in the near future. A connecting road from Maturatta to Brookside is a necessity, if the railway is to receive Maturatta Produce.

TATAPARAI SCHEME.—So far as it has been tried appears to work satisfactorily.

LABOUR.—Is none too plentiful though in a fairly settled condition, advances are normal.

RIFLE CORPS.—Has now being formed and consists of 17 members. Range has also been settled upon at Dickson's corner and is now being made.

CONCLUSION.—Although the prices for the first six months were not so good as last year a very decided improvement has now set in, and it is to be hoped we have heard the last of depression in the tea industry as a decided better tone appears generally both at home and in Ceylon.

NUWARA ELIYA PLANTERS' ASSOCIATION.

REPORT FOR 1902.

The past year has not been an eventful one as far as this Association is concerned, and consequently it has not been necessary to call many meetings.

The number of members who have paid subscriptions individually or on account of estates is 19, as against 18 last year.

The annual official estimate of tea crop for 1903, is as follows :—

	Estates	Total Acreage	Bearing Acreage	E'mated Crop lb.
Nuwara Eliya Ramboda New Galway Kandapola	20	6,720	6,615	3,118,500

—the estimate yield being at the rate of 471 lb. per acre, as against 466 lb. for 1902.

The past season has not been altogether a satisfactory one as regards yield, the main factor in bringing about this result has been the abnormally wet sunless weather during the latter part of the year, coupled with a considerable amount of damage done in certain properties, by frost in the first quarter of the year. The price for high-grown tea has continued to be disappointing

LABOUR.—During the first half of the year was fairly plentiful, but few estates are as fully supplied as could be wished to meet the demand, which may be expected in the ordinary course during the second quarter of the year.

INCREASED ADVANCES.—Your Committee regret that owing to the scarcity of labour coming in from the coast, advances are increasing and at the moment stand at rather a higher figure than they did at the same time last year.

THE TIN TICKET SYSTEM AND REGISTRATION OF ESTATES—has worked satisfactorily during the year, and will prove, we trust, a great boon to planters generally.

PESTS AND BLIGHTS.—Your Committee is glad to report that the district has been free of them during the year.

HEALTH.—The general health of the coolies in this district has been quite satisfactory and there has been complete immunity from any serious epidemic.

RICE—during the year was rather cheaper, but the price is still rather high.

RAILWAY EXTENSION FROM NUWARA ELIYA TO KANDAPOLA.—The resolution passed at the last meeting of the Association having been forwarded to Government, Mr. Oliver, the Chief Resident Engineer of the Northern and Udapussellawa Railway extension, was dispatched to meet a deputation of this Association composed of Messrs. W A Mooyart-Denison, C J Bayley and S P Blackmore, with whom were associated the Provincial and District Engineers (Public Works Department) who kindly attended to the invitation of your Committee. The deputation pointed out to Mr Oliver some of the most dangerous places where the railway encroached on the cart-road. These, he proposed himself to have fenced of with wire, and in a few instances to limit projecting corners. In the opinion of your Committee these minor protections are quite inadequate to make the road (the only road of any merit as a drive for residents at the Sanatarium) safe for horse traffic, which it must be made, for local purposes.

FINANCES.—The finances are in a satisfactory condition. The credit balance is R97·51, as against a balance last year of R85·76.

(Signed) S. P, BLACKMORE.

PRICE OF RUBBER.

A very determined effort is being made to raise the price of india-rubber. We are favoured daily with all sorts of reports about it, and if we had taken it seriously every time we were told it was "a penny up," we should now be in despair. We hope in the interests of the Trade to have no higher price ; manufacturers do not want 1897-1898 to be repeated.

A meeting is supposed to be held annually which is kept strictly secret of various rubber dealers. The chairman produces a lot of tickets which have got quite faded and black from age and long usage, and taking one at a time, the meeting discusses its chances. The first is headed "flood," and describes how that the rains have been so heavy that the floods have not yet subsided. The rubber gatherers are waiting, but as yet the water covers the earth, and nothing can be done. So much time has been lost that it will be quite impossible to gather sufficient rubber before the rainy season begins again, and a short crop and high prices are inevitable. The next card is quite topsy-turvey. Here the rains have been so slight that the rivers are quite unnavigable. The rubber is there, but getting it down to the ports is the difficulty. The rivers are not likely to rise before the season ends so a short crop, etcetera. The next card is a terrible picture. We would turn from it in horror. It depicts fever-stricken men left to die in misery and solitude, while others are escaping by any possible means from the pestilential land. It would be simply inhuman to expect rubber to be gathered under such conditions. The crop will not simply be short ; it will be a mercy if there be any crop at all. These are the three chief trump cards. There are others of lesser importance, but which have at times come in handy. The shortness of silver does duty occasionally, though that might reasonably be expected to work the other way. If a gatherer has to bring two pounds to get his silver dollar instead of one, there should be all the more rubber. But the card is used all the same. Then the native is getting so well off that he will not work. They have all done duty many times before ; one or other of them has turned up every year, when the crop was 5,000 tons, and when it has got to 25,000 tons. The only one we have any sympathy with is the shortness of silver. We often feel that way ourselves. The meeting drags them all out, considers carefully which is the most likely to be swallowed this year and adopts it. Then, through the whole of the india

rubber manufacturing world, for some weeks nothing else is heard but this. Somehow, rubber buyers always seem to take the bait. They remind us very much of that stockbroker whom one of our contemporaries recently spoke of. The man had a dream; dreamed that he was dead, and had passed to the regions beyond, where, as a new comer he was shown round by an older inhabitant. They came to a place where the fire was terribly hot, but men were walking about in it unharmed. To his inquiry who these were his companions expressed surprise. "Why do you not know them? They are your clients. They are so green they will not burn."

Rubber manufacturing for some years has not been very profitable, and with increased competition and indifferent trade, the outlook is none too bright. The attempt to rig the price of the raw material must be nipped at once or it may do harm. The remedy is easy, in our opinion. Let the larger manufacturers agree that if Pará goes over 3s 6d they will close their works till it comes down. They will not be closed long, and as their chief lines are in things the rival firms are unable to tackle, they will lose no trade by it. They will do themselves and the whole trade a service.—*India-rubber Journal*, Jan. 5.

MR. WILLIAM JACKSON AND HIS PATENTS.

Mr. William Jackson of Tea Machinery fame now informs us that he cannot say much about his new "Planet" Tea Rolling machine, that would be of general public interest at the moment, beyond the fact that his experimental tests in New Peradeniya factory, with this machine, have satisfied him that a satisfactory Roller will be the outcome of his exertions.

Mr. Jackson leaves for England as soon as he possibly can, to have the results of his experiments put into practical form, and hopes to have the improved "Planet" at work in the Island before the end of the year.

His liquid-fuel burning arrangement, as applied to a Paragon Dryer at Labookellie, Ramboda, is giving every satisfaction we hear. This apparatus requires no steam for its use, is very simple and easily handled by the cooly-attendant, and maintains an even temperature of 200 deg. or more if desired, with a consumption of about four-and-a-half gallons Liquid fuel per hour. This includes time for getting up heat when starting, and loss by machine occasionally running empty. The Liquid fuel costs about 12 cents per gallon in Colombo and the actual cost will vary on different gardens, in relation to the cost of transport, but generally speaking the cost per gallon on gardens, within reasonable range of the railway, will be from 20 to 30 cents.

The advantage of this compressed-air system of burning liquid fuel, are clearly set out in circulars that may be obtained from Messrs. Walker Sons & Co., Ltd., or the apparatus may be seen daily at work on the Labookellie Garden, by appointment with the Manager there.

RANGALA PLANTERS' ASSOCIATION.

REPORT FOR 1902.

Your Committee in discharging its duty begs to submit the third annual report of the Rangala Planters' Association.

Register.—The number of subscribers is twenty-one.

Meetings.—There have been three general and two committee meetings during the year, at which the attendance was good.

Accounts.—A statement of the accounts is laid upon the table, shewing a balance of R36·55 to credit.

Official Estimates.—The total crop of 1903 is estimated at 2,098,000 lb., out of which 150,000 will be made into green teas.

Tea.—The feeling of confidence expressed in the last annual report was not altogether warranted, and the season has not been so favourable as was anticipated; owing to the inclemency of the weather yields have, with a few exceptions, been less and prices have ruled somewhat lower. The year closes with a firmer and more confident tone.

Cardamoms.—The crop for the last year has been the largest secured, being 56,000 lb. over the previous season. The pickings during the latter half of the year were exceptionally heavy, the dry spell of weather in the early part of the year suiting the higher-lying estates. Most of the crop secured from September to December is still in store, and the quantity being large, will add considerably to the exports for 1903, which it is estimated, will slightly exceed last year's outturn. Very little new land has been added to the planted area, only a few acres here and there having been opened up. The cultivation in native lands has quite come to a standstill owing to the fall in prices.

Labour.—The labour-supply in the district remain much the same as usual, and whereas some estates are short-handed, others have maintained the labour forces up to requirements. Your committee would recommend special efforts being made to recruit for new districts; with the tin-ticket system and a competent recruiting Agent this seems feasible.

Hospital.—The unofficial Hospital Visitors report satisfactorily on the Hospital at Teldeniya and the Ferndale Dispensary. Their reports and recommendations will be laid before you.

Post and Telegraph.—The telegraph line was opened to the public in February and has proved a great benefit; but a new Post Office at Teldeniya to combine both the Postal and Telegraphic business is desirable.

Light Railway.—A sub-Committee was appointed to collect statistics in connection with the proposed extension to Teldeniya and the project is under consideration.

Police.—The scheme for amalgamating the present Police Forces into one central station at Teldeniya was suggested by the Government Agent; it is hoped that the alteration which promises a more thorough system of patrols in co-operation with the headmen, will have the desired effect of better efficiency.

Labour Federation.—No cases have been brought before the General Committee and matters are working harmoniously.

Ceylon Planters' Rifle Corps.—The C.P.R.C. has been well supported during the year, and the shooting as compared with the previous year has greatly improved, there being seven marksmen, four extra-efficients, two efficients, and two non-efficients, whereas in 1901, there were one marksman, five extra-efficients, seven efficients, and five non-efficients. It is to be hoped that all new-comers will join the corps. The new drill ground is in a central position, and if possible a new range will be made.

Main Roads.—These have been kept in good order through the year.

Minor Roads.—The sums voted by the District Road Committee have been advisedly spent and these roads are much improved.

THE GANGAWATTA ESTATE COMPANY OF CEYLON (LTD.)

REPORT OF THE DIRECTORS.

Acreage :	Tea in full bearing	...	335 acres
	,, partial bearing	...	2 ,,
	,, not in bearing	..	8 ,,
	Grass land	...	10 ,,
	Total	...	355 acres.

The Directors beg to submit their Sixth Annual Report and Statement of Accounts for the year ended 31st December, 1902.

The total Crop of tea secured for the year, including 12 lb. carried over from season 1901, amounted to 188,135 lb., against an estimate of 170,000 lb. a most satisfactory result in the face of a season, the second half of which has been almost universally unfavorable.

The whole of the crop, save 10,500 lb. on which a safe average is struck, has been sold, in Colombo, and has realised R67,175·94, or an average of 37·82 cents per lb. as compared with 38·62 cents in the previous year.

The yield is 560 lb. per acre.

The cost of production, including 1·98 spent on manure, works out 25 13 per lb as against an estimate of 26 cents. In the expenditure is also included a sum of R1,075·29, cost of repairing the dam, an unexpected item, and of course unprovided for.

92 acres were manured on the Bitterne Division with artificial manure. This completes the first round of manuring the property.

The Working Account shows a net revenue of R23,475 94, to which has to be added a balance from last season of R158 and R2·50 transfer fee. Out of this an interim dividend of 3 per cent has been paid absorbing R5,355. After providing for interest (including interest on mortgage), for Superintendent's Commission, Auditor's and Secretariat Fees, there is an available surplus of R13,947·55, which the Directors propose should be apportioned as follows : –

		R.	c.
To Final dividend of 4 per cent	...	7,140	00
To depreciation Account	..	1,050	00
To Reserve Account	..	4,503	67
To Directors' Fees	..	1,000	00
To Balance to next season	..	253	88
Total	..	13,947	55

The Estimate for 1903 points to a crop of 180,000 lb, expected to cost R47,584·75, including cost of manure R5,180·00.

In terms of the Articles of Association Mr W Anderson retires by rotation from the Board of Directors and is eligible for re-election.

The appointment of an Auditor for the current year rests with the Meeting.

The Directors wish to record the loss they have sustained by the sad death of their colleague, Mr Shelton Agar, since their last Meeting.

KALUTARA PLANTERS' ASSOCIATION.

THE ANNUAL REPORT, 1902.

Your Committee beg to present the annual report for 1902.

MEMBERSHIP.—The number of estates on the register is 28, one less than the number last year.

MEETINGS.—Two General, three Committee, and three Sub-committee meetings were held.

CROP ESTIMATE.—

		Total acreage.	Acreage in bearing.	Total tea crop.
1903	...	16,692	16,045	6,977,265
		Green Tea.		Native Tea.
		2,206,265		139,500

—139 acres of tea-land were abandoned during the year.

		1902.
Estimated Crop	..	6,970,743
Actual Crop	..	6,672 519

LABOUR.—The supply of the district has been fully good during the year, but more use has been made of the resident Sinhalese than in late years. Recently instances have occurred of the agents of other districts trying to recruit labour from us, and the general feeling at the close of the year was that the force was becoming unsettled, with a more or less general demand for increase of advances, which at present stand at a low average rate per head.

THE MARKET—for low country teas was very weak during the first part of the year, but latterly there has been some improvement, and the present year opens with much brighter prospects.

GREEN TEA.—During the year 1,149,500 lb. of green tea have been made, which have found a ready sale at remunerative prices.

PARA RUBBER.—Several small clearings have been opened, and there are now about 360 acres in the district planted with rubber only, and it is estimated that there are 300,000 trees and plants of various ages growing through the tea.

CROP.—The output of the district shews a very considerable increase over that of the previous years, amounting to 7 tons of cured rubber, against 3½ tons in 1901. The excellent quality of our rubber has been well maintained and although the extreme price realised early in 1901 has never since been obtained prices for Ceylon rubber in London continue to be considerably higher than the average paid for rubber from any other part of the world.

SEED:—There has been a brisk demand for seed and plants during the year. Out of 1,300,000 seeds sold, only 414,000 were sent out of the Island, all the rest were despatched to various parts of Ceylon, the Kelani Valley taking the greater quantity, as well as most of the 460,500 plants, which were sold by various estates.

EXTENSIONS:—Next year some 450 acres will be opened in rubber, and most estates are now planting it more or less generally through the tea. The amount of land suitable for rubber cultivation is not large, so that the output will necessarily be limited.

In view of the great probability of rubber being stolen, a sub Committee consisting of the Chairman, Secretary, and Messrs Tipple & Bagot, was formed in April to consider this question. The matter was referred to the Committee of the Planters' Association of Ceylon and is now in the hands of our Member in Council.

TELEGRAPH EXTENSION TO NEBODA:—Your Committee are glad to be able to report that the telegraph office at Neboda, which this Association has been agitating for since 1893, is to be opened very shortly.

POSTAL ARRANGEMENTS:—The postal service, which year Committee stated in last year's report was most unsatisfactory, has been altered and now gives general satisfaction. The thanks of the Association are due to the Postmaster-General for running the two services as asked for.

PROVINCIAL ROADS:—The very meagre expenditure allowed on these roads has made it impossible for the Department to maintain them in a satisfactory condition. To maintain the roads in even passable order at least double the money is required, and your Committee hope that during the ensuing year more liberal votes will be sanctioned.

DISTRICT ROADS:—The residents much appreciate the work which has been done on the Tebuwana-Anguratota bridle path, but the great proportion of the road is unfit for traffic, three bridges being in an unsafe condition. The minor roads generally are in fair order, but on some, notably the Tudugala-Tebuwana road, over which there is considerable transport of leaf and tea, the amount allowed for upkeep and repairs is quite inadequate.

CRIME.—Your Committee regret to report a marked increase of crime in the district, chiefly in the form of burglaries, highway robbery, cattle lifting &c. Efforts to bring the criminals to justice are but very partially successful, and your Committee cannot think that if a better watch were kept on the movements of numerous bad and doubtful characters, who live in the district without having any visible means of support, much might be done to improve matters.

The C P R C.—Your Committee are glad to report that the Planters' Rifle Corps has been well supported during the year.

The KALUGANGA NAVIGATION COMPANY.—A steamer service under this title has been running between Kalutara and Anguruwatota since April of this year, and your Committe would report the very high appreciation of the district for this great step in transport facility. From the point of view of the shareholders the results have not been at all satisfactory, but the district is to be congratulated on the data and figures of traffic which the 8 mouths' working showed. Under new auspices and on a basis more fitted to obtain traffic there seems no reason why this service should not become permanent and be a success in the future.

FINANCE.—The balance in the Bank at the close of the year amounted to R539·29; there is a further sum of R500 on loan to the Kalutara Cricket and Sports Club.

DOLOSBAGE AND YAKDESSA P. A.

ANNUAL REPORT 1902.

MEMBERSHIP :—The number of subscribers to the Association was 35 including 2 private votes.

MEETINGS ;—There were two general and three Committee meetings held during the year.

FINANCE :—The balance at credit was R178·15 plus R5·94 due to the Association by the Nawalapitiya short cut making a total of R184·09.

SEASON :—The past season has not been a good one. Crop has been generally short owing to unfavourable weather and other causes. The market at the same time has been the lowest on record.

THE ESTIMATE OF CROP FOR 1903 is as follows:—

Aveiage in tea	16,316	
do do bearing	15,901	
Black tea	5,907,500	
Green tea	285,000	6,192,500
Native leaf		154,000
Total		6,346,500

This being 389 lb. per acre against 400 in 1901.

LABOUR :—The supply during the year was sufficient on most estates a few only being short. Your Committee is pleased to be able to state that the services of the Federation Committee were not requisitioned.

TIN TICKETS :—Your Committee considers that the Tin Ticket system has worked admirably.

PESTS :—Your Committee regrets that the district has not been free from pests during the past year. Helopeltis appeared on some estates and Borer has doubtless accounted for some of the shortage on others.

RIFLE CORPS :—A section has been formed during the year and a Rifle Range established at Penny-lan.

CEYLON NURSING ASSOCIATION :—Your Committee recommends Superintendents to ask their Proprietors or Agents to allow them to subscribe annually on estate account to this excellent institution.

MATALE PLANTERS' ASSOCIATION.

THE ANNUAL REPORT.

In bringing forward the report for the past year, your Committee has pleasure in being able to state that the position of the Association continues to be satisfactory. The number of estates on the register is 63 against the same number last year ; the finances are in a satisfactory condition, the meetings have been well attended and the various subjects discussed have been followed with keen interest.

Following our custom the reports on the different products of the district have been written by members specially interested in each. The position of tea has if anything, improved since last year and ws may add that the Association is satisfied with the manner in which the XXX Committee deal with the interests of our staple. Cocoa is agriculturally in a sound position and prices are better than last year though still rather uncertain. The heavy rains of the last three months of 1902 did a great deal of damage and caused serious loss to what promised to be a very favourable crop, also producing recrudescence of canker. The crop picked for the year, however, was a satisfactory one and probably the largest. the district has ever sent away. The cocoa stealing question is in the hands of the Planters' Association, that body having on the 4th November last unanimously adopted a resolution brought forward by your Chairman. His Excellency the Governor intends to appoint a Commission to enquire into the question. The delay which this will cause is very disappointing and in the opinion of your Committee unnecessary, as the facts on which the Association rests its case, have been put into pamphlet form and can be enquired into at any time. These facts were accepted as establishing a grievance, when a deputation waited on the Lieutenant-Governor on 28th June last, and we were then told that what was necessary to enable Government to take up the case, was a favourable expression of native opinion : that expression of opinion has been obtained. A large and influential deputation of native cocoa growers, headed by Mr Daniel Joseph, waited on the acting Colonial Secretary in September last and obtained a favourable reply. Lists were circulated amongst the native proprietors for signature and were signed by over 600 owners. The following paragrapb headed these lists in English, Sinhalese and Tamil and was drafted word for word by the A G A of Matale, and approved of by him, before the lists were sent round for signature. That paragraph is also word for word the resolution which was passed by the P A on the 4th Nov., last, so that the Planters and A G A of Matale, who has devoted special attention to this question, are at one on this point ; and the conditions demanded by the Lieut-Governor have been fulfilled and yet the case has been delayed. Assuming however that a Commission is necessary, it is difficult to understand the delay in appointing one which has taken place since the opening of the Legislative Council, and by which, any legislation is postponed for another year and until His Excellency Sir J. West Ridgeway has left the island. Your Committee can only express its disappointment and surprise. The paragraph referred to is:—

SPECIAL LEGISLATION FOR CACAO STEALING.—"We, the undersigned, are of opinion that the law, as it now stands, is not sufficient for the protection of cacao-proprietors. We would, therefore, respectfully suggest some amendment of the Prædial Products Ordinance, which, while continuing to make the possession of *green* cacao without a satisfactory account of such possession an offence, might also provide against the dishonest possession of *ripe* and *cured*

cacao. We should also be grateful for any protection against 'receivers' which the Government may be disposed to grant."

Your committee is of opinion that the cultivation of Para rubber and coconuts, as being valuable adjuncts to that of cocoa, can be largely extended in this district. The growth of Castilloa rubber in Matale is also very satisfactory.

The unlicensed sale of toddy in this district continues almost unchecked and causes a deplorable amount of drunkenness amongst our coolies, and is a constant incentive to theft of produce from the estates. The A G A of Matale recognises the evil in the last Administration Report of the Central Province and remarks "I have no reason to believe that offences of this kind could be put down except by fresh legislation."

RAILWAY.—Your Committee wishes to thank the General Manager for the alteration of the afternoon train, so as to give an additional train to Colombo in the day. A serious washaway occurred on the Matale line in November last, and caused great inconvenience by the stoppage of traffic. Your Association addressed Government on the subject with the result that the aerial railway lately in use at the Boer Camp will probably be acquired by Government for use on such occasions. Your Committee also hope to see an emergency gang of coolies under skilled supervision, formed by the Railway authorities, to take slips and washaways in hand directly they occur. In accordance with the request of this Association a Goods Shed has been erected at Ukuwela.

POST OFFICE.—Your Association addressed the other Associations of the island on the subject of the extension of hours for postal money order business and received an encouraging amount of support.

LABOUR.—Sinhalese are largely employed in the district, and where they are available it may be said to be fairly well supplied with labour, but the supply of Tamil labour is insufficient. Difficulties between kanganies and superintendents, or between superintendents, are happily few and far between in Matale, so that the labour Federation does not receive the attention that might otherwise be the case.

The C M I AND THE C P R C are well supported in Matale, the number being 11 for the former and 24 for the latter, and efficients are: C M I 11 and C P R C 19.

TEA.—Extensions both in India and Ceylon are very limited, and consumption is increasing in every country. The American demand for our greens is highly encouraging, and the rapid increase in the consumption of our teas in Russia is a most promising nature. The industry appears to be on a sounder footing than it has been for years The yield for 1902 has been somewhat larger than last year, on most estates, owing to the very favourable weather during the early part of the year, and the falling off in yield during the last quartor was owing to the continued wet weather, and there has been no serious drought or pest in the district during the year under review. The rainfall on one estate which might be taken as typical, was at the end of August, only 3·90 inches ahead of last year, but at the end of December was 34·92 inches in advance of 1901. Manuring has perhaps been done to about the same extent as last season, with beneficial results, but it is to be hoped that this will not be overdone, with the tempting prices now ruling for our teas. The style of plucking in vogue on most estates in 1901, has been generally adhered to during the past year, and will, we hope, be continued. Prices ruled very low for the first nine months, but took a welcome turn upwards during the last quarter, and the year closed with fairly good prices, and good prospects for the new year, should the output be kept within reasonable limits. Very little green tea has been made in the district, and we are of opinion that the increase in the tea cess will be very beneficial to Matale.

The comparative figures for the year under review, and for 1903 are as follows;—

	Total, acreage in Tea.	Acreage in bearing.	Balance young clearings.	Estimated Crop 1903 including greens.	Green Tea Estimate.
1902	19,566	17,345	2,221	7,613,215	No returns.
1903	19,459½	18,403	1,056½	8,362,575	148,000
Increase	—	1,058	—	749,360	—
Decrease	160½	—	1,164½	—	—

	Black Tea Estimate.	Yield per acre.	No. of Estates.	Native leaf.	Tea abandoned.
1902	7,613,215	418	79	no return	407
1903	8,214,575	454	80	61,750	330
Increase	601,360	36	1	—	—
Decrease	—	—	—	—	77

COCOA.—The agricultural position has improved in the district during the past year, and it is noteworthy that those estates which suffered first from canker and disease, are now better than they have been before. Those that were attacked late, are recovering, whilst some estates which have only recently been attacked, have their struggle before them. It is satisfactory to know from our experience, that this struggle will in all probability be successful. Speaking generally Forastero has maintained a comparative immunity from disease, and it is probable that as the acreage of red cocoa decreases this immunity will be more marked, as less disease will be harboured on estates, and hybridisation with the weaker variety will not be so frequent. It will be seen, therefore, that a constant importation of a fresh stock of plants from the West Indies, and elsewhere, is very important to maintain the strength necessary to resist disease amongst our trees. At the representation of the Cocoa Committee, Government has arranged for a fresh importation of plants, but this should be made an annual occurrence, so that later on a fresh and healthy supply of seed could be always available The past year promised to be a record one, as regards crop in Matale, and although probably more cocoa has been sent away last year than ever before, the Autumn crop has been a disappointment on some estates. This is entirely owing to unfavourable weather in the North-East Monsoon. Considerably more rain fell in October, November and December than in the preceding nine months of the year, and the consequence was a recrudescence of canker especially amongst the pods, by which the crop suffered very seriously, both in quantity and quality. Prices have been better during the past year, and a satisfactory point is that our Forastero Cocoa is now going readily in consumption in England. Also it is to be noted that a considerable quantity, cwt. 8,641 was shipped East from Colombo, thereby giving our produce another outlet and taking what is probably inferior cocoa off the home market. The acreage of European cocoa estates in Matale is as nearly as can be ascertained 8,465 acres, of which 7,000 are in bearing—that of native owned cocoa is given by the A. G. A., Matale, at 2,250 acres. This is not supposed to be more than approximately correct, and having been estimated by headmen, whose ideas of area are vague, is probably exaggerated. The native cocoa is younger than that on estates, so that even accepting the above as correct, it is a liberal estimate to take 1,500 acres as in bearing. The Railway returns have unfortunately not yet been received in a complete form, but such figures as are available point to an average yield of 2 cwt per acre. Cwt 1,137 were sold to natives by Europeans. Cocoa stealing has been fully dealt with elsewhere, and it is sufficient to point out that the legislation, which the A. G. A, of the

district and the growers of cocoa, both European and native, agree in thinking necessary, is nothing new. By Ordinance 22 of 1886 cinchona was protected in the following manner:—

'Whenever the bark of the branch, root or stem of the cinchona shell be found in the possession of any person who is unable to account for his possession thereof, such a person shall be deemed and judged guilty of an offence and shall on conviction, be liable to the punishments provided for theft of prædial products under section 368." To which lashes might be added. This protection was obtained for the up-country planters by Mr Thomas North Christie, and never pressed unduly on any honest man. Your Committee wishes to point out that the Madras Act has failed, because it is found impossible to exercise sufficient check over the owners of native gardens, and this is precisely the difficulty here. The Grenada Ordinance had to be amended, so as to make it similar to the Cinchona Ordinance mentioned above, with the addition that any person convicted under it *must* be lashed in addition to any other punishment. In fact, it seems, in dealing with such a subject that the protection given to cinchona in Ceylon, is the only feasible protection, as we find the Mauritius Ordinance for the protection of vanilla to be exactly similar. Your Committee recognises and appreciates the efforts made by the A G A, of Matale, Mr Alexander, to suppress cocoa theft, but individual effort is not the proper thing to rely on in such a matter. Officials are changed, then often the previous policy is reversed; as an instance, we quote from the P.A. report of 1895, in dealing with this subject.

"The acting Government Agent, Central Province, has threatened the headmen that unless cocoa stealing is prevented and put down, a force of police will be quartered and maintained at the expense of any village where such thefts prevail." This promise has not been kept. If it had been, it is probable that the demand for special legislation, would not have been necessary.

CARDAMOMS.—Extension among European and native cultivator go on apace, almost every pocket of forest suitable is destined for this cultivation. At present, Matale district alone has probably 2,000 acres under cardamoms, or about 1·5th of the total cardamom acreage of the island. The cardamom estimate for 1902 was 600,000 lb, for the island, but the total crop shipped was 615,922 lb, and a large portion remains to be shipped during the early months of 1903 which will add considerably to this year's crop. The total estimates for 1903 are not likely to be short of 700,000 lb.

COCONUTS.—Coconut planting in Matale is steadily increasing both amongst natives and Europeans, but on European-managed estates they are generally grown as an adjunct to other cultivations, so that it is difficult to give an accurate idea of the area under this product. It is found that a distance of 25' to 30' apart is the most suitable for planting in this district and where trees are in full bearing, the yield has been found to be exceptionally good. There is no doubt that all the lower parts of the Matale Valley are well adapted to this cultivation, which should pay handsomely.

PARA RUBBER—Report by Mr F J Holloway:—The chief points to be cleared up concerning this product are in what soil, and at what elevation can Para rubber be profitably grown:—On Kepitagalla there are trees growing from 500 feet to 1,500 feet above sea level, and on keeping a careful record of yield at the highest and lowest elevation, the result has been that the yield is practically the same, although the trees are smaller in growth higher up age for age. And so to soils, they seem to yield well in most soils, except in a sandy one, where they will not yield anything. As to yield I will quote from my letters to the "Times of Ceylon" and Ceylon *Observer* of Aug. 22nd, 1902:—

Number of trees tapped once...3,903
Dry rubber from 1st tapping ...2,128

or just over half a pound per tree, some of these trees were tapped again and gave equal results, thus making 1 lb rubber per tree per year. Each tree should be tapped twice a year and will yield more as it gets older. Trees tapped were 8 to 11 years old.

And now as to cost of production.

Dry rubber gathered from Jany. to May, best quality 1,302 lb		
Scrap ... ... 60 lb equal to 1,362 lb.		
Cost of tapping and curing 1,362 lb rubber	R570	63
Transport rail fare, boxes, &c. ..	31	13
Tapping knives, tins, &c. ..	36	60
Total cost in Colombo..	R638	36

on an average cost of 46-86 cts per lb sold at an average price of R2·63 per lb. The cost has been further reduced to 45 cents at end of October, and later sales averaged 3s 11d. The average quantity brought in by a cooly per day was nearly one lb when dry. Seed being plentiful and cheap, it would not cost R7 per acre to plant up this rubber on the suitable portions of existing estates. The exports of dry rubber will probably exceed 12 tons this year. The price of Para rubber has risen from 3s 0½d at the beginning of the year to 4s at the time of writing, but the latter price has only been procured by Ceylon marks—no other part of the world fetching anything within 6d of this price.

CASTILLOA RUBBER grows well all over the lower parts of Matale, and seems to thrive in a dry climate, and on hillsides, as well as in flat and damp situations. On Ambanganga estate, which is devoted to the cultivation of this variety of rubber, the growth is exceptionally fine and promising. As fas as experiments have gone in tapping trees of this variety the yield has been satisfactory, and there is every reason to look for good results.

The Hon. SECRETARY then brought up the following statement of accounts, which was passed:—

1902 December 31st.	R.	c.		R.	c.
By balance from 1901 ..	94	51			
Do 63 subscriptions at R5 ..	315	00	—Total	409	51
To stamps, postage, etc. ...	28	39			
Do printing ..	9	50			
Do stationery ...	45	10			
Do advertising meetings ..	33	75			
Do purchase of one deed box and one minute book	14	11			
Do rent Borron Hall ...	10	00			
Do donation, Hatton Nursing Home ..	20	00			
Do contingencies, viz: coolies' batta, tolls, telegrams and commissions on cash and cheques ..	11	25			
Do balance carried forward to 1903 ..	237	41			
	R409	51			

B H JENKYNS, Hon. Secretary, December 31st, 1903.

Audited and found correct.—J B TENNANT, January 15th, 1903.

MORAWAKKORALE PLANTERS' ASSOCIATION.

THE ANNUAL REPORT.

The following Report of the Committee for the year 1902 was read and adopted on the motion of the CHAIRMAN:—"Your Committee, in submitting the first Annual Report of the Morawakkorale Planters' Association, is able to congratulate you on the satisfactory status of the Association.

SCHEDULE.—The number of Estates on the register amounts to eight.

MEETINGS.—Five Committee Meetings and five General Meetings have been held during the year.

GENERAL.—Your Committee have carefully watched the interests of the district during the year.

FINANCES.—A statement of accounts is laid upon

the table showing R12·65 in hand, which is satisfactory at the end of the first financial year.

CROP.—For 1903 is estimated at 1,255,720 lb. against 1,243,918 lb. in 1902. Acreage in bearing, 3,178 acres at an average of 395 lb. per acre, and 110,000 lb. tea from native gardens. Nearly all estates in the district have fallen short of their estimates; the weather was not nearly so favourable for flush as 1901.

PRICES.—The tea industry has passed through another trying period in its history, but the closing months of the year brightened considerably. While viewing the present position with satisfaction, it is to be hoped that the producers may not be tempted by the temporary rise to adopt a coarser style of plucking. Your Committee would urge Superintendents in this district to continue the same style of plucking which has been in vogue for the past year.

CARDAMOMS.—The area has not been extended to any great extent.

TELEGRAPH EXTENSION—from Rakwana to Deniyaya:—Your Committee record with great satisfaction the sanction, through 1903 estimates, of extending the line from Rakwana to Deniyaya and trust the Postmaster-General will have the work pushed on with all possible haste as this outlying and important district is under great disadvantages in this respect.

POSTAL ARRANGEMENT.—Since the departure on sick leave of the late Postmaster, your Committee have noticed a great improvement. Letters and parcels have been handed over very promptly after the arrival of the mails, which have also come in with far greater punctuality than previously. The new Post Office is nearing completion, but in the opinion of your Committee the cost of the same is rather exhorbitant.

JURY SERVICE.—With reference to this matter a resolution was forwarded to Government pointing out the great hardship entailed on residents in this remote district by their being called upon to serve once every year, and not infrequently twice, at the Matara Sessions. This resulted in the persons liable to serve in Tangalla being added to the list of jurors. In spite of this, however, two members of this Association were summoned to serve twice this year. Your Committee are of opinion that some further action on the part of Government is necessary to relieve residents of this unjustifiably heavy tax on their time and convenience.

GOVERNMENT CART ROAD FROM AKURESSA TO VIHARAHENA—has been in a most disgraceful state for several months of the year. The fault of this road chiefly lies in there being no foundation to it. An extra grant has been passed in Council for R3,000, but your Committee are of opinion it is insufficient for what has to be done. A "Special Report" was to have been made after which they hope a more liberal vote will be allowed.

MINOR AND GRANT-IN-AID ROADS.—In fair order with the exception of the Deniyaya-Hayes Road, which was originally constructed so badly.

MEDICAL ARRANGEMENTS.—Deniyaya Hospital:—It is to be regretted that Government have not thought fit to entertain the suggestion of erecting a Village Ward which, your Committee thinks, is an absolute necessity.

HOSPITAL VISITORS.—Your Committee consider that the thanks of the Association are due to the Hospital visitors for the past year.

LABOUR.—The Labour supply has been insufficient for requirements in some instances.

ADVANCES.—In mostly all cases, may be considered satisfactory, for an outlying district such as this. Your Committee are happy to state advances are on a downward tendency.

PESTS.—With the exception of Helopeltis which has attacked some estates rather severely, no pests have been recorded.

CEYLON NURSING ASSOCIATION AND THE BENEVOLENT FUND.—An appeal on behalf of these having been received, it is to be hoped members of the Association will give them their support,

In conclusion your committee congratulate the members of this Association on the results obtained during the first year.

Signed. E. R. E. Geddes, *Chairman*,
,, Roland J. Trimen, *Hony. Secy*,
,, Edw. C. Anderson, } *Committee Members.*
,, Rodney Mylius, }
,, Geo. Thain Davidson, }

SCIENTIFIC NOTES.

A German newspaper records the following exemplary incident, apropos of a recent act of the Kaiser, in appealing to his people for support in a good work. Dr. Dohrn of Naples, having appealed with little result to the German Minister of Education for financial aid in the extension of his world-famed biological station, sought an interview with the Kaiser. Remarking sympathetically that he could not provide all that Dr. Dohrn desired from his private purse, the Kaiser furnished him with a donation form, headed by himself and a contribution of £1,000, commanding that it should be circulated among the leaders in Berlin society, for return to the Kaiser in person. The result was that within a few days the magnificent sum of £15,000 was subscribed.

A message from the *Times* correspondent at Ottawa states that the promoters of the Canadian Maraconi Company hope by the end of next summer to have a complete system of wireless telegraphy in operation throughout Canada, extending from the Gulf of St. Lawrence to the Pacific Coast.

Mr. Marconi was entertained at a banquet at Sydney on December 30 by the citizens of Cape Breton Island. Reuter reports that in responding to the toast of his health, Mr. Marconi said that when his system of wireless telegraphy was further developed, it would be possible for ships in distress to signal passing ships. The cable companies, when they began, charged pounds per word; they were now down to shillings, and his starting at ten cents might soon lead to a charge of one cent ½d. per word and thus bind England and her colonies more closely together.

The *Daily Mail* states that Sir Ernest Cassel has offered to give £40,000 towards the study and investigation of ophthalmia in Egypt.

Prof. Robert Koch and two assistants, Surgeon Dr. Kleine of the Prussian Headquarter Staff, and Dr. Neufeld, of the Prussian Institute for Infectious Disease, are on their way to investigate cattle plague in Rhodesia. To the Berlin correspondent of the *Daily Mail*, Prof. Koch has remarked:—"I contemplate my mission with more or less misgiving, because the Rhodesian plague is of an absolutely mystifying character. Such symptoms as I have so far examined indicate that the disease is wholly indifferent from any species of rinderpest that has ever come under medical observation. What is peculiarly baffling is that the Rhodesian plague dates only from the late war. The cattle imported from Egypt, Australia and South America which it was supposed would prove immune, have fallen early victims to its ravages, which threaten to denude the entire colony of live stock. While in South Africa, I shall not neglect the opportunity of continuing my tuberculosis experiments with the view of adducing still more positive evidence of my theory of the non-communicability of bovine tuberculosis to human beings, which I, of course, adhere to resolutely."

The outbreaks of typhoid fever at Winchester and at Southampton again direct attention to the possibility of the typhoid infection being spread through the agency of shell fish, in these instances through oysters. Dr. Nash, in a report on an outbreak of typhoid fever at Southend-on-Sea, finds that the incidence of the disease was thirty-six times as great among shell-fish consumer as among those who do not eat shell-fish, and expresses the opinion that if the eating of shell fish were abandoned in Southend, the incidence of typhoid fever would lessen by fully one-half. In the Southend outbreak, cockles were mainly responsible for the spread of the infection.—*Nature*, Jan 8.

In a letter to Wednesday's *Times*, Sir Norman Lockyer states that several months ago he discussed with Mr Shaw, the secretary of the Meteorological Council, the desirability of obtaining information regarding barometric pressures from ships crossing the Atlantic, by utilising wireless telegraphy. It now seems probable that this idea will soon be practically realised, for in reply to an ethergram from Mr Marconi, Sir Norman Lockyer asked for help in this matter, and on January 13 received the following message :—" By wireless telegraphy.—Thanks for suggestion, hope to be able to do so soon, big westerly gale here Monday.—MARCONI." Sir Norman remarks that all friends of Science will be grateful to Mr Marconi for such generous and invaluable assistance which will undoubtedly be of enormous advantage to British meteorology.

An exhibition is being held in London of the results of what is described as a new process for the preservation of animal tissnes, by the injection of a fluid, the composition of which is not made public. The process is said to afford a satisfactory method of embalming animal bodies and of preserving museum specimens in a condition closely resembling life. The period which has elapsed since the application of the process to the various preparations exhibited is said by the inventor to range from a few weeks to thirty years.

In a letter from Dr. Logan Taylor, the leader of the Sierra Leone expedition of the Liverpool School of Tropical Medicine, reference is made to the progress of the expedition in Sierra Leone. A very decided absence of anopheles larvæ in places where it was formerly easy to get any number has been noticed, and is due to their not being able to breed owing to the pools being either swept out or oiled regularly. Compared with the corresponding time last year, in some of the notoriously bad streets where in a single house as many as six, seven or a dozen anopheles mosquitoes could be found in the early morning this year, after searching house after house with great difficulty, one, or perhaps two, adult insects alone were discovered. Since the members of the Liverpool School expedition stopped clearing up yards and emptying out the water containing culex larvæ, no one else has taken up the work, and these insects are getting bad again, and unless the Government or the school will keep on the work, the money the school has spent on it will be almost thrown away.

Symons's Meteorological Magazine for December last contains a climatological table for the British Empire for 1901, so far as it can be shown by nineteen representative stations, but it is not claimed that the records quoted furnish more than a few useful samples of the various climates included in the British dominions. The highest temperature in the shade was 110° at Adelaide, in February. A new station has been included, viz. Dawson, where a temperature of 50° in the shade was recorded in December, but the observations are incomplete. The highest mean temperature was 82°·1 at Colombo, and the lowest 36°·4 at Winnipeg. The driest station was Adelaide, mean humidity 59°; and the dampest Colombo, mean humidity 82°. The highest temperature in the sun was 168°, at Trinidad. The greatest rainfall was 114 inches, at Lagos, and the least 18 inches, at Adelaide. None of the extremes referred to can claim distinction as "records," but at individual stations the sun temperatures at London, 139°·8, and at Malta, 162°·9, are the highest observed there, and at London the number of rainy days, 128, is the lowest since these interesting tables were commenced.

The first three parts of the second volumes of the *Records* of the Botanical Survey of India have been issued. Mr J J Wood has compiled a list of plants mainly from the province of Chutiá Nagpur. This part includes a map of the district and two sectional diagrams. Mr Grammie has recorded the results of his investigations into plants used during periods of drought. For the purpose of making bread, seeds of species of Indigofera, Cyanotis and Panicum are used. Other sources of nourishment are the leaves of Amarantus, Rivea and Leptadenia. A systematic enumeration of the species of Calamus and Dæmonorops, by Mr O Beccari, is based mostly on plants growing on in the Malayan Peninsula and the adjacent islands, and only a few species belong to India or Ceylon.

" Tiree marble," with notes on others from Iona, by Mr Ananda K Coomaraswamy. [Now appointed Government Mineralogist for Ceylon.—ED. *T.A.*] The gneiss near Balephetrish has a general south-westerly and north easterly trend, and the limestone occurs in it as lenticles. Descriptions of the varieties of the limestone in this locality are given. The inclusions comprise those of gneiss containing quartz, felspars, hornblende, augite, scapolite and sphene as characteristic minerals, and mineral aggregates, consisting of sahlite, coccolite, scapolite, sphene, apatite, calcite and mica. The contact-phenomena are not specially well displayed. The dynamic phenomina include the rounding of the minerals and the formation of "augen." The carbonates are present as a fine-grained granular matrix. Although there are exceptions, gneiss-inclusions and mineral aggregates have usually been protected from the effects of extreme pressure. The description of minerals includes carbonates, pyroxene, amphibole, fosterite, scapolite, sphene, mica, apatite and spinel. Various marbles are described from Iona, where they are associated with actinolite-felspar schists and others; they are included in the gneiss. —*Nature*, Jan. 15th.

"FOLIAR PERIODICITY IN CEYLON."—Mr. Herbert Wright's paper on this subject which appeared in full in our columns has since been reproduced in "Indian Planting and Gardening" and "West Indian Bulletins"; while abstracts have been given in "Annals of Botany, London" and in several home and Ceylon papers.

GLASGOW ESTATE COMPANY, LTD.

THE ANNUAL REPORT.

DIRECTORS :—Messrs. G H Alston, G C Walker and J G Wardrop.

ESTATE INSPECTOR :—Mr J K Clark, ESTATE SUPERINTENDENT :—Mr R W Kerr.

ACREAGE :

Tea in full bearing ..	..	600	acres
Tea partial bearing ...	..	41	do
Tea not in bearing ..	..	9	do
Grass ...	..	2	do
Jungle, &c ...	...	62	do
Total Estates	..	714	acres

The Directors have now to present their Annual Report and the Accounts of the Company for the past year.

The tea crop secured was 380,500 lb., against an estimate of 400,000 lb., thus showing a shortfall of 19,500 lb., which was due to the continued rain and absence of sunshine during the last 4 months of 1902. The average nett price realised was 44·66 cts. per lb., as against 43·66 cents for the previous season, which may be considered satisfactory.

The amount at credit of profit and loss account for the year's working was R73·902·54. The balance brought forward from last year amounted to R2,251·09 from which falls to be deducted R300 00, being extra fees for the Directors for 1901 working, in terms of the resolution passed on 18th February, 1893.

The sum therefore available for distribution is R75,853·63 and the Directors now recommend that a final dividend of 15 per cent be paid for 1902, making with the Interim Dividend of 7 per cent paid on 5th August last, a total of 22 per cent for the year, and that the balance of R4,353·63 be carried forward to the current year's accounts. It will be noticed that there has been no addition to the capital expenditure and any additions or alterations to machinery or buildings have been paid for out of revenue.

The estimate for the current year is 392,000 lb. Tea on an expenditure of R96,447 00. A sum of R3,000·00 will be required for a new Roller necessary to deal with the increasing crops from the estate. As notified in the circular posted to Shareholders on the 12th ultimo the entire crop has been sold at 50 cents per lb. *f.o b.* Colombo, which may be considered very satisfactory.

During the year under review the Hon. Mr W H Figg resigned his seat on the Board, and the Directors appointed Mr G H Alston to the vacancy.

In terms of the Articles of Association Mr G H Alston now retires from the office of Director, but is eligible for re-election.

Colombo, 28th January, 1903.

UPPER MASKELIYA ESTATES CO., LTD

THE ANNUAL REPORT.

DIRECTORS :—Messrs Jas Polson, W D Gibbon and G H Alston. Estate Superintendent :—Mr L A Wright.

ACREAGE :

31ST DEC. 1902.

	Brunswick and Bloomfield.	Caskien.	Total.
Tea in full bearing	446	207	653
Tea not in bearing	10	—	10
Grass, Timber Trees, &c	62	—	62
	518	207	725

The Directors herewith submit to the Shareholders the Accounts of the Company for the past year.

The Crops amounted to 358,032 lb Tea, being 18,032 lb in excess of the Estimate, and realised a nett average of 38·75 cents which included the bonus granted on the manufacture of Green Tea.

The amount at credit of the year's working is R42,645·85 equal to 12·17 per cent on the paid up Capital of the Company, to which has to be added R1,564 86 brought forward from last year, making a total of R44,210·71 available for distribution.

The Directors now recommend that a final dividend of 7 per cent be paid forthwith, making with the Interim Dividend of 5 per cent paid on the 5th August last a total of 12 per cent for the year, and that the balance of R2 210 71 be carried forward to the current year's working.

The estimate for the present year is 350,000 lb of Tea on an expenditure of R94,885·05 which includes a sum of R11,767 to be spent on Manuring.

The Crop for the current year has been sold by contract as intimated in the Circular issued to Shareholders on the 1st of December last. The Thirty Committee bonus having now been reduced to 4 cents per lb the buyers have to pay the Company 37½ cents per lb of Green Tea.

In accordance with the Articles of Association Mr James Polson now retires from the Board, but is eligible for re-election.

Colombo, 28th January, 1903.

CEYLON PROVINCIAL ESTATE CO., LTD.

THE DIRECTORS' REPORT.

DIRECTORS :—J Paterson, Esq., Edward S Grigson, Esq., F L Clements, Esq.

The Directors beg leave to submit their Report for the year ended 31st December, 1902, together with a Statement of Accounts for the same period.

The Tea Crop secured during the twelve months amounted to 471,617 lb, against an estimate of 510,000 lb and is equal to an average yield of 484 lb per acre from the area in full and partial bearing. In the case of Glassaugh the Crop was fully up to estimate in the matter of quantity, but Brownlow fell short of expectations to the extent of close upon 40,000 lb. The finer or more careful system of plucking referred to in the last Annual Report was continued throughout 1902, and the Brownlow shortage is partly attributable to that circumstance, but chiefly to unfavourable weather in the latter half of 1902.

The Revenue and Expenditure Account shews the year's profit to have been R93,098·14.

The cost of production in 1902 has been 24·65 cents per lb, which includes 1·06 cents spent in manuring, as compared with 25·02 cents and 1·69 cents respectively for Season 1901.

The Crop has sold at an average nett price of 44·20 cents per lb. against 44·10 cents in 1901, and 42·56 cents in 1900.

During the past year the Company's liabilities have been decreased by the repayment of a loan of R20,000 thus reducing the "Loans on Mortgages" item in the Balance Sheet from R127,473·57 to R107,473·57. R10,000 of the sum repaid was set aside from the 1901 profits, and the balance of R10,000 has been met out of the past year's surplus as shewn in the Profit and Loss Account.

Including a sum of R3,144 58 carried forward from Season 1901, the Profit and Loss Account shews a balance at credit of R46,198 68 after payment of an interim dividend of 3 per cent interest on Mortgages, Bonus allowances to Superintendents, and provision made to the extent of R17,500 for Mortgage redemption and depreciation of Buildings and Machinery.

The Directors now recommend the payment of a final dividend of 6 per cent which will absorb R39,960 and make 9 per cent for the twelve months, and that the balance remaining, after payment of Directors' Fees, be carried forward to Season 1903.

There was no expenditure on Capital Account during the past season.

The Estimates for the new season point to a yield of 489,000 lb of Tea, to cost 25·14 cents per lb, inclusive of an allowance of about 2 cents per lb for manuring and burying prunings.

The following is a definition of the Company's properties as at the 1st January of this year:

	Glassaugh.	Brownlow.
Tea in full bearing ...	469 acres	503 acres
Do in partial bearing ..	21 do	— do
Do not in bearing ..	2 do	— do
Total in Tea ..	492 do	503 do
Fuel trees ..	14 do	2 do
Forest ...	— do	33 do
Grass ...	— do	27 do
Scrub and Waste ..	13 do	20 do
	519 acres	585 acres

Mr J Paterson retires from the Board in terms of the Articles of Association, and is eligible for re-election.

The appointment of an Auditor for 1903, rests with the Meeting.

By Order of the Directors.

GEORGE STEUART & Co., Agents and Secretaries.

Colombo, 30th January, 1903.

THE HIGH FOREST ESTATES CO., LTD.

REPORT OF THE DIRECTORS.

DIRECTORS.—Messrs. R F S Hardie, G H Alston, J G Wardrop; Estate Inspector:—Jno. Gordon, Estate Superintendent:—D Lyall.

ACREAGE.

Tea in full bearing	645 Acres.
do partial bearing ..	453 ,,
Clearings	15 ,,
Wind Belts and Timber Clearings..	94 ,,
Grass, Scrub. &c.	48 ,,
Jungle and Patna	356 ,,
Buildings and Roads	19 ,,
Total ..	1,630 Acres.

The Directors have now to place before the Shareholders the Accounts of the Company for the past year

The crop secured amounted to 451,045 lb. Tea, being 22,045 lb in excess of the estimate.

The average nett price realised for the Tea was 42·63 cents per lb. against 46·30 cents per lb. in 1901, and the cost of laying down the Tea in Colombo was 25·14 cents per lb.

The old fields under Tea have been resurveyed, all wind belts, ravines, building sites, roads, &c. being deducted and placed under their different headings, and the acreage given above as under tea is now the correct one.

With reference to the remarks in last years's report, as there is no chance of recovering the Coast Advances referred to, the Directors have now written off R3,678·67 from the amount set aside for Reserve Account.

After writing off a sum of R14,020·63 for Depreciation of Buildings and Machinery, equal to over 1½ per cent on the Capital, the amount at credit of Profit and Loss Account for the year's working is R57,859·89, equal to 6·09 per cent on the paid-up Capital of the Company, to which has to be added the balance of R20,949·21 brought forward from 1901. The Directors now recommend the payment of a final dividend of 3½ per cent, making with the interim dividend of 2½ per cent paid on the 5th August last, a total dividend of 6 per cent for the year, and that the balance of R21,809·10 be carried forward to the current season's accounts.

The expenditure on Capital Account during the past year amount to R26,808·00, for the upkeep of young Tea not in bearing, and for necessary additions to Buildings and Machinery. After completion of the additions and alterations now being made very little Capital expenditure in this direction will be required

The estimate for the current years is 441,000 lb. Tea on an expenditnre of R206,623·56, and R12,701·00 on Capital Account, for completing the additions and alterations, mostly paid for in 1902.

During the year Mr. G B Leechman resigned his seat on the Board on his departure from the Island, and Mr. R F S Hardie was appointed in his place.

In terms of the Articles of Association Mr. Hardie now retires from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.—By order of the Directors, WHITTALL & Co., Agents and Secretaries.

Colombo, 28th January, 1903.

THE AGRA OUVAH ESTATES CO., LTD.

DIRECTORS:—Messrs J G Wardrop, G H Alston and Jas. Polson Estate Inspector:—Mr R K Clark. Estate Superintendent:—Mr Wilson Smith.

ACREAGE.

31st December, 1902.

Agra Ouvah.	acres.	Fankerton.	acres.
Tea in full bearing	322	Tea in full bearing	165
Grass and Jungle	9	Timber clearing	20
		Grass, Patana & Scrub	8
Total Estate	331	Total Estate	193

Grand Total 524 acres.

The Directors now have to present to the Shareholders the Account for the past year.

The crop secured amounted to 333,789 lb being 9,961 short of the estimate, due to the abnormal weather experienced during the last few months of the year.

The average nett price realised for the Tea was 45·33 cents per lb, against 45·65 cents per lb in 1901. The cost of laying down the Company's tea in Colombo was 25·46 cents per lb.

The amount at credit of Profit and Loss Acconnt for the year's working is R63,658·09, equal to 16·98 per cent on the paid up capital of the Company, to which has to be added a sum of R2,069·16 brought forward from 1901, making a total sum of R65,727·25 available for distribution. On 5th August last an interim dividend of 7 per cent was paid, absorbing R26,250, and the Directors now recommend the payment of a final dividend of 10½ per cent, making 17½ per cent for the year and that the balance of R102·25 be carried forward to this season's account.

The estimate for the present year is 343,750 lb Tea on an expenditure of R83,904·67, which includes a sum of R5,336 for manuring.

During the year the Hon Mr W H Figg resigned his seat on the Board, and Mr G H Alston was appointed to fill the vacancy. In terms of the Articles of Association Mr J G Wardrop retires from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year rests with the Meeting.

U.S.P. ESSENTIAL OILS.—Kremers continues his observations on the proposed volatile oils of the U S P. 1900, his last instalment (*Phar. Rev.*, 1902, 544) dealing with oils of chenapodium and cinnamon. The oil of American wormseed has been little investigated, but observations since the last U S P indicated that the sp. gr. should be lowered from 0·970 at 15° C. to 0·910, and that the oil does not give a clear solution with ten times its volume of 70-per-cent. alcohol. The optical rotation is − 18·55° for 100 mm. The note on cinnamon oil is necessarily more lengthy, and a trifle confusing to those who apply this name solely to oil of Ceylon cinnamon, since the note deals with oil of cassia, which is official in thirteen pharmacopœias, and oil of cinnamon in eight pharmacopœias. The author suggests the inclusion of Ceylon cinnamon oil in the U S P, as it is far superior to cassia oil. He deals fully with the characters of the latter oil, its assay and adulterants.—*Chemist and Druggist*, Jan. 17.

THE NEBODA TEA COMPANY OF CEYLON, LIMITED.

THE REPORT OF THE DIRECTORS FOR 1902.

DIRECTORS:—Messrs Joseph Fraser, Chairman, and Robert Morison, Director; Solicitors to the Company: Messrs. F J and G de Saram: Agents and Secretaries: Messrs. Somerville & Co.

ACREAGE:

Toa in fnll bearing	..	495 acres.
Forest Land, &c.	..	171½ „
	Total.	666 acres.

The Directors snbmit report and accounts to end of December, 1902.

The crop secured was 228,597 lb, an increase of 19,550 lb over that of 1901. Gross average sale price in Colombo was 32·05 cts as against 30·34 cts in 1901. Cost of production, including mannring was 24·01 cts, without mannring 20·59 cts.

On the 495 acres Tea the average yield per acre was 461 lb. It is estimated that with medium fine plucking 1903 will shew an increase in this yield, and the estimate has accordingly been put down at 250,000 lb. During the year Factory appliances have been improved by the addition of two large Sirocco Fans, which will, it is hoped, put and end to the trouble and loss hitherto experienced in wet weather.

Profit and Loss Account shews a credit balance on the year's working of R18,071·60. Out of this R2,000 has been written off for Machinery depreciation, and an interim dividend of 3 per cent was paid in July last. The Directors now recommend the payment of a further 3 per cent making 6 per cent for the year, and the carrying forward of the balance to next year's acconnt.

In terms of the articles of Association Mr Joseph Fraser retires from the Board, but is eligible for re-election.

The meeting will appoint an Auditor for the current year.

By order of the Directors.—SOMERVILLE & Co.,
Agents and Secretaries.
Colombo, 30th January, 1903.

THE AGRA TEA COMPANY OF CEYLON, LTD.

THE REPORT AND ACCOUNTS FOR 1902.

The acreage of the Company's property is a under:—

Tea in full bearing ..	..	321 acres
Tea in partial bearing	..	6 do
Tea not in bearing	..	9 do
Total in Tea	..	336 do
Forest	...	21 do
Grass, Waste Land, &c.	..	10 do
Total area of estate	..	367 acres

The estimated crop for 1902 was 200,000 lb. of tea, and the aotual quantity realised was 197,050 lb., or a deficiency of 2,950 lb. This crop realised R81,532·96, equivalent to 41·38 cents per lb. as against 39·64 cents in 1901. The expenditure, as shown in the accompanying accounts, was R52,626·47, or nearly 27 cents per lb., as against 29 cents per lb. in 1901. The expenditure during the past year includes rather over 3½ cent for manure.

After deduction of R4,000 for Depreciation of buildings and machinery, the profit on working account for the year amounts to R24,183·83, representing about 6 per cent on the value of the property as shown in the balance sheet.

After payments of interest on loans, viz, R5,269·60, the net profit for the year amounts to R17,564·30, to which has to be added the snm of R3,652·88 brought forward from 1901, bringing the balance at credit of profit and loss acconut up to R21,217·18.

During the past year the sum of £500 has been paid to the Standard Life Assurance Co. in reduction of the mortgage, which now stands at £5,500.

In view of the fact that £1,000 has to be fonnd in June next for the purpose of paying the instalment which will then be due to the Standard Life Assnrance Co., the Directors do not feel justified in recommending any dividend at the present time. They hope, however, that in the event of the price of tea being maintained during the ensuing year, they may be able to recommend a small dividend, 12 months hence. They therefore propose to transfer R20,000 to the credit of the Reserve Account, thus bringing the total of that Reserve up to R50,000, and leaving R1,217·18 to be carried forward to next season's acconnts.

The estimated crop for 1903 is 205,000 lb. of tea to be produced at 27½ cents per lb., which allows for about the same expenditure on mannring as last year.

In terms of the Articles of Association, Mr Joseph Fraser retires from the Board of Directors, but is eligible for re-election.

The appointment of an Auditor will rest with the meeting

THE PITAKANDE TEA COMPANY OF CEYLON, LIMITED.

REPORT AND ACCOUNTS FOR 1902.

DIRECTORS:—Messrs. Joseph Fraser (Chairman). Edward C Mitchell and Robert Morison.

SOLICITORS:—Messrs. F J and G De Saram.

ACREAGE:

		Acres.	Acres.
Tea in full bearing ..	..	760	
Tea in partial bearing ...	..	194	
Tea not in bearing ...	..	46	
			1,000
Cocoa and Tea ..	..		12
Cardamoms in bearing ...	..		44
Do not in bearing	..		4
Cocoa in bearing ..	..		50
Fuel Trees ..	..		18
Total cultivated area ...			1,128
Forest and Grass Land ..	..		283
Wast Land and Buildings	..		30
Total area of Estate ..			1,441

The Directors submit their report and acconnts for 1902.

The tea crop seonred amonnted to 430,399 lb. being 42,929 lb. more than last year. The net average price realised was 35·15 cents, whilst the cost f. o. b. was 28·601 oents, including manure and burying prunings, or 22·180 cents exclusive of these items.

The net profit for the year was R23,297·23, to which has to be added R2,132·22 brought forward from 1901. An Interim Dividend of 4 per cent was paid in July, and the Directors now recommend a final Dividend of 4 per cent, making 8 per cent for the year, and leaving balance of R629·45 to be carried forward to next year.

In terms of the Articles of Association, Mr Edward C Mitchell retires from the Board of Directors, but, being eligible, offers himself for re-election.

The appointment of an Auditor rests with the meeting.—By order of the Directors, Colombo Commercial Co., Ltd.,
(JOHN G. WARDROP, Manager.) Agents & Secretaries.
Colombo, 27th January, 1903.

HAPUTALE PLANTERS' ASSOCIATION.

27TH ANNUAL REPORT.

Your Committee has the pleasure of laying before you the 27th Annual Report, and in so doing congratulate you upon the continued prosperity of the Association.

The number of estates on the register is 47, the same as last year. Finances are in a satisfactory condition and the meetings (three Committee and three General) held during the year have been satisfactorily attended.

OFFICIAL ESTIMATE.

	Acres in Tea.	In bearing.	Total Crop.	Green Tea.	Native Leaf.	Yield per acre.	Abandoned.
1903	18,710	15,780½	6,194,975	455,000	682,000	392	No return
1902	18,608½	14,806	5,928,565	145,000	487,000	400	173½
Decrease	—	—	—	—	—	8	—
Increase	102½	974½	266,410	310,000	195,000	—	—

Season.—The past season has been an abnormally wet one, resulting in a general shortage of output, which should have a beneficial result of prices in the near future.

Coffee.—Everything points to a further reduction of the acreage under this product, and a corresponding decrease in the crop.

Roads.—Your Committee regrets the inconvenience the District has been put to by the long deferred erection of that bridge connecting the Leangawela cart road with the Koslande bridle path. The main and minor roads have been kept in satisfactory repair during the year, and your Association's thanks are due to those who have supervised the work. Your Committee hopes that the bridle path, connecting the Ohiya cart road with the Horton Plains road, will be opened to the public at as early a date as possible. The construction of the Haputale-Dambatenne cart road has been sanctioned by Government, and the work is soon to be taken in hand.

Labour.—The District has been well, on the whole, supplied, but your Committee regrets that the roving disposition of coolies—so much complained of in other districts—is more apparent than in previous years.

Estates Registration Scheme.—In the opinion of your Committee this scheme is working satisfactorily and has greatly simplified the importation of labour.

Crime.—Your Committee is glad to state that the representation made by the Association to Government in June last, regarding the prevalence of crime and drunkenness in the district has not been without effect, and your thanks are due to the Government Agent for the stringent measures taken by him on several occasions. The illicit sale of arrack and toddy still continues, but in a less degree; fines inflicted seem to have little effect on offenders, and, it is hoped, that no efforts will be spared to put a stop to the illicit sale of both intoxicants.

Medical.—The District Medical Officer reports that the general health of both Europeans and natives during the past year has been satisfactory, that there have been no epidemics of any kind, but that the late long period of wet weather has been the cause of an increase in pneumonia and dysentery cases.

Volunteers.—During the past year sections of the C M I and C P R C have been formed, numbering respectively 14 and 25.

Representative in Council and Chairman of the Parent Association.—To these two officials your Committee beg to convey its thanks and appreciation of valuable work done and services rendered.

Finances.—The amount shewn at the credit of the Association is R27·58 as against R160·82 for last year. During the year the following donations were made:—Ceylon Nursing Association R50, Victoria Memorial Eye Institution R50, The Society of Prevention of Cruelty to Animals R25.

KELANI VALLEY PLANTERS' ASSOCIATION.

THE ANNUAL REPORT.

Meetings.—Five committee meetings and two general meetings have been held during the year.

Finance.—The balance to the credit of the Association at the end of December 1902 is R595·34 as against R601·37 last year. Donations have been made to the Memorial to the late Mrs W E Davidson and to the Coronation Celebrations. A detailed statement of accounts is circulated amongst members.

Schedule.—The number of subscribers to the Association is 74 as against 72 in the previous year. During the year two estates have resigned owning to amalgamation (one estate has rejoined and three estates have joined as new members.)

Crop.—The estimated crop for 1903 is 16,707,550 lb. including 5,240,800 lb. green teas. Acreage in bearing is 36,394, or an average yield of 459 lb. per acre. Your Committee view with satisfaction the substantial increase in the green tea estimate, viz, 4¾ million in excess of last year.

Labour Federation.—Four cases have been brought before the K V L F during the year. One appeal for readmission has also occupied a considerable amount of time of the Committee. This appeal has finally been allowed. Certain alterations and additions to the local rules, deemed necessary by the Committee in consequence of one of these cases, have been duly passed at a general meeting of the Federation, and your Committee trust that the amended rules will work smoothly.

Prices.—The prices obtained for black tea have been much about the same as in 1901. Plucking if anything, has been finer, as is shown by the reduced yield per acre. It may be pointed out that the style of plucking in the district is now practically settled in Colombo and London, as there are few estates in private hands. Your Committee view with regret that the action of the London Association in connection with the proposed increase of development of the green tea industry which is now the only solution of the over production problem.

K.V.R.—It is with feelings of the greatest satisfaction that your Committee are able to report the formal opening of the first section of the line in September, for passenger and goods traffic to Avisawella. Your Committee considers that this Association is deeply indebted to the Chief Resident Engineer, and also wish to put on record their appreciation of the tireless energy of the Assistant Engineers, Messrs Edwards, Fraser, Waghorn and Bowen, who, in the face of many difficulties have made it possible for Mr Phillimore to redeem his promise as intimated to you last year. The large passenger and goods traffic already being carried over this section of the line, augurs well for its further success when opened to Yatiyantota, and proves the accuracy of the figures and statistics collected at the commencement. The works on the remaining section of the line, between Avisawella and Yatiyantota are being prosecuted with vigour, and have been practically completed to Karawanella, and the whole line will be finished within a few months, when it is hoped that H.E. the Governor to whose action the realisation of the Kelani Valley Railway has been due, will honour the district by formally opening the line in person. The arduous Polatagama cross-country road will be ready for traffic on completion of the line to Yatiyantota and will form an outlet for the West Dolosbage traffic. In conclusion your Committee are pleased to report that a farther extension of the Railway to Ratnapura is being considered, and that the preliminary survey will be finished within five months.

Roads.—Continual and heavy rains during the latter half of the year have done considerable damage throughout the district and this has caused much inconvenience. Your Committee cannot help feeling

however that more money is nrgently needed for general maintenance, for the keeping of the roads in a better state of repair. Your Committee have to express their regret, a regret which is doubtless shared by the Director of Public Works, and the Provincial and District Engineer, that the causeway built over the Avissawella river at Algodde has proved an absolute failure. A further canse for anxiety is the N-E approach to the Ruigala Oya bridge.

TELEGRAPHS.—Your Committee are glad to be able to report that the necessity for a telegraph office at Dehiowita has been recognised, aud that this important section of the district will no longer be left without rapid means of communication with the outside world.

LABOUR.—There has been a fine supply of labour throughout the year, and the tin ticket system is working satisfactorily. The labour question, however, continues to give cause for anxiety, and it cannot be denied that Canganies and coolies generally are much more inclined to bolt, give notice, and repudiate their debts, than formerly.

PEST.—A Report on Helopeltis in the Kelani Valley has been received from Mr Green with certain suggestions and recommendations. Four estates have been selected to forward to Mr Green, periodically, specimens of pruuings. It is hoped that by careful attention to directions this pest may disappear.

COACH SERVICES.—The Yatiyantota-Veyangoda coach ceased to run at the end of the year. An additional coach between Avisawella and Yatiyantota has been started. Your Committee regret that repeated applications for an extension of this service to Kitulgalle have been unsuccessful. The last communication from the P M G was to the effect that no funds were available for a snbsidy.

C. P. R. C.—The Kelani Valley section of the C P R C which was started last year, has on the whole, been well supported. A good range has been made at Dehiowita, and a marked improvement in shooting may be looked for in the future.

RUBBER.—During the past year one clearing has been opened in this product, and a considerable acreage planted np through the tea on various estates. The cultivation of rubber in this district is still in its infancy but there can be little doubt that it will eventually prove to be an important item in crop returns of the Kelani Valley.

BALANGODA PLANTERS' ASSOCIATION.

ANNUAL REPORT FOR 1902.

REGISTER.—The estates on the roll now number 15 ; there are also 2 private subscribers.

MEETINGS.—Three general meetings were held during the year, the average attendance being 9. The attendance should be improved and I should only be too happy for any suggestion as to longer notices, &c., that would make this better.

FINANCES.—I lay on the table a statement of accounts for the year.

CROP.—The estimate for 1903 is as follows :—

Total acreage in tea	... ...	5,761 lb.
Acreage in bearing	... ..	4,776 lb.
Total tea crop	... ...	2,050,000 lb.
Estimate of green tea to be made	..	409,000 lb.
Estimate of Native Leaf ...	..	11,500 lb.
Acreage of tea land abandoned during the past year	... ..	64 acres.

Average 429 lb. made tea per acre.

This shows an increase of 10,000 lb in crop and 110 acres of tea in bearing. There is, however, to be noted an item of 409,000 lb, green tea as against nothing last year. This is good and it is to be hoped that some satisfactory solution of the Cess difficulty may be arrived at so as to allow full payments to be made to those who really are helping us out of the overproduction difficulty. The average yield for the district is about the same as last year. I hope that the better prices at present ruling will not tend to coarse plucking being resorted to.

WEATHER.—The season was an abnormally wet one, but none the less suitable for the greater portion of the district—1903 has also been ushered in with plenty of rain, so that possibly we are in for a wet cycle.

ROADS, GOVERNMENT CART ROAD.—This is in excellent order, the gravelling of the less frequented portion being a great improvement. There is, however, one matter which I am bringing up later in the form of a motion and that is the straying of cattle on the road. The thoroughfares Ordinance inflicts a possible £5 fine and I think we should invoke the Government Agent's aid.

BALANGODA-CHETNOLE ROAD.—This road was begun in November and the rate of progress so far is satisfactory. The earth work has been practically completed on the first two miles and the culverts &c. on one. The first two miles should be ready for traffic in June when the third mile will be begun. It has not been touched as yet. There is a sum of R30,000 available for this year.

COURTHOUSE.—The Court has sat in the new Courthouse for most of the year, but it is only a temporary building and I think we should ask for one of those ornate if not palatial buildings that Government, I understand, are favouring the other end of the province with. The session dates have been altered to Tuesdays and Wednesdays in the second and fourth weeks so as to allow the Magistrate to travel by coach. By the courtesy of the District Judge programmes for the first six months have been issued.

POSTAL.—Our thanks are due to the P.M.G. for having so promptly acceded to our request about the alteration of the Mail Service and we are now asking for the coach to run on Sundays as well. The new order of things has so far worked well and the coaches come in to time.

HOSPITAL MATTERS.—I regret that the three improvements urged for some time namely :—(1) The removal of the mortuary, which is situated at present close to one of the wards. (2). A covered way between the kitchen and wards and (3). The laying down of water supply—still remain to be done. I think they are all reasonable and should be attended to without loss of time.

We were deprived of the services of two nurses for a portion of the year, but the staff has now been brought up again to its proper strength.

Mr. Kirby places his resignation before the meeting and you will be asked to nominate some one to serve as Hospital Visitor. Your thanks are due to the Visitors for their services during the year.

LABOUR FEDERATION.—No cases have yet been brought before the Committee, which is eminently satisfactory.

THE TIN TICKET SYSTEM.—I have not heard any complaints in the district about the working

of the system and it seems to me simple enough. At the same time there is no doubt we are short of labour and any scheme to remedy this evil (such as Mr. Westland's) should receive our support. The ruling rate for advances seems to be very high.

Ratnapura Railway Extension.—You will be asked to pass a vote of thanks to H.E. the Governor for sanctioning the survey of the line and also to Mr. Stiven for his work as Hon. Secretary on the Extension Committee. Surveyors are now at work from four different points and I do not see why the railway should not be sanctioned before His Excellency hands over the reins of Government. My name has been put forward by the Ratnapura and Rakwana Associations as Chairman of the Railway Extension Committee in place of Mr. Wright, who is not in the island, and I have accepted subject to your approval.

Resthouse at Kotiyagala.—I am sorry to say that I do not think we shall get this. We have tried the two P. R. C.'s and finally the Hon. the Colonial Secretary, but have failed. The matter is however on the Agenda paper today and we might have one more try.

Conclusion.—I have now gentlemen, to thank you for your support and attendance to me as Chairman of the Association. We are only a small number in this district, so that everybody should make an effort to attend the meetings and make them as representative as possible. I now vacate the chair.

INDIAN TEA ASSOCIATION.

(From the Report of the General Committee for the year ended 31st December, 1902.)

The General Committee have now the honour to submit to members their Report for the past year. Mr Lockhart Smith was elected Chairman in place of Mr Ashton; and Mr W Warrington (who had succeeded Mr Brown in March) was elected Vice-Chairman.

American and Foreign Market Fund.—The subscriptions received during the year for this Fund amounted to R55,564-11-6.—A sum of R52,500 has been devoted to the export bounty on green teas.—The tea rooms at 48, Faubourg St Honoré, Paris, have been also maintained; and work in Italy, Turkey and other European countries has been pushed on as vigorously as the limited funds at the disposal of the Association would permit.—In the early part of the year advertising in America had to be discontinued owing to the uncertainty about funds. The result was that Indian teas lost ground to a certain extent; while Ceylon teas—which have been and are still being actively pushed—made greater progress even than before. Later in the year it was found possible to renew the advertisements which are at present appearing as formerly. Now that the Cess is practically an accomplished fact, it may be confidently said that much more strenuous and sustained efforts will be made in America than have been made in the past. At the present moment it is not possible to indicate the extent to which Indian tea will be able to take advantage of the St Louis Exhibition. But to the General Committee there would seem to be no reason why a portion of the Cess Funds should not be expended on an exhibit; although this is, of course, a matter which the Cess Committee will be called upon to decide. At the same time the existence of the Cess affords no reason why Government should not be asked for financial assistance.—Another opportunity of pushing Indian tea in what is believed to be a promising market, will be afforded by an Exhibition which is to be held at Capetown in November, December, January and February 1903 and 1904. So far but little has been done in South Africa by Indian tea producers. But during the past year an arrangement was made by the London Association with an agent in Johannesburg to sell a minimum quantity of 1,200 half chests of suitable tea in consideration of a bonus of 1½d per lb. The tea was to be bought in Calcutta by Messrs McLeod & Co., who, up to date, have shipped 490 half chests. No information is of course available at present as to the reception the teas have met with in South Africa. But it is stated that the quality of the tea usually sold in the Transvaal is very inferior; and that the price is about four shillings a pound. If this is so, there would seem to be no reason why Indian teas at moderate prices should not find a ready market.

Consumption of Tea in India.—Throughout the year the Indian Tea Markets' Expansion Commission—which was mentioned in the last Report—has vigorously pushed the sale of tea in India. It has been thought that the work of the Commission has been hampered by the sale in the Calcutta bazaars and elsewhere of tea refuse. Large quantities of this commodity are sent to Calcutta; and although a fair proportion is sold to reputable European firms for the manufacture of caffeine, there is no doubt that much is disposed of for local consumption. At the instance of the Committee, Messrs Andrew Yule & Co. have made enquiries into this trade; but without the co-operation of all producers, there does not appear to be any prospect of its being suppressed.

Indian Tea in Russia.—It was stated in the last Annual Report that the Committee were giving attention to the possibility of developing the Russian market. In the absence of funds for advertising purposes, they have since been making enquiries as to the different routes by which Indian tea is carried to Russia. In March they invited the attention of the Bengal Chamber of Commerce to the question. They asked if the Chamber could take any action which might be calculated to promote the establishment of a direct line of steamers between Calcutta and Russian ports. The Committee of the Chamber expressed the opinion that the direct trade between Calcutta and Russia was too insignificant to warrant the establishment of a direct line. Sir Charles Scott, the British Ambassador at St Petersburg had intimated, in an official despatch to the Foreign Office, that if British Navigation Companies were to enter into arrangements with Russian Railway Companies, they could obtain the same reduced rates as the Volunteer Fleet. The Liners' Conference submitted the question to the various steamship-owners, who would, they hoped, make arrangements for assisting the development of the tea trade in Russia. More recently the Committee suggested to the Bengal Chamber of Commerce that an attempt should be made to pursuade the Russian Government to reduce the import duties on tea. No action will however be taken, as His Majesty's Ministers think there is no substantial case so long as the duties do not differentiate against Indian tea;

INDIAN TEA IN AFGHANISTAN.—The Afghan officials to whom reference has been made expressed themselves as being well satisfied with the samples sent to them. But so far it has not been found to be possible to work up the trade to any extent.

INDIAN TEA IN PERSIA.—In their last Annual Report the Committee referred at length to the mission to Persia which had been undertaken by Mr. E. G. Foley. As a result of that mission two or three caravans with fairly large quantities of tea from the Kangra Valley, Dehra Dun, and Calcutta, were despatched by the Nushki Seistan route to Meshed. The reception which was accorded to these experimental ventures did not however justify further efforts. It was only with the greatest difficulty that the tea was disposed of even at the lowest prices. In the case of the caravan from the Kangra Valley no tea was sold for some months, the prices offered being barely sufficient to pay the cost of carriage. Business in Persia is not conducted on cash basis, credits frequently extending for two or three years; and sales of tea at twelve months credit were effected by the Kangra Valley agent with difficulty.

INDIAN TEA IN CHINESE TURKESTAN AND TIBET.—An expression of opinion was invited by Government as to what would be a reasonable rate of duty in Thibet having regard to (*a*) the cost of transit from India to Tibet, and (*b*) the price at which China tea is sold at Lhasa. The General Committee, to whom the point was referred, expressed the opinion that the duty should not exceed that levied on China tea imported into India. At this point the question stands at present, at least so far as Thibet is concerned. The Government of India have not yet given any indication as to whether they can take action in regard to Chinese Turkestan.

CEYLON IMPORT DUTY ON TEA.—The Committee referred in their last report to a representation which they had made to the Government of India upon certain matters relating to this duty. Their main suggestion was of a two-fold nature. Firstly, that the Ceylon Government should be asked to exempt Indian tea from the payment of the import duty of four annas per lb; and secondly that, if necessary, the Indian Government should similarly exempt Ceylon tea from the payment of the five per cent *ad valorem* duty levied in this country. Further, the Committee proposed that, if the Ceylon Government declined to make this exemption, the Indian duty should be enhanced to a protective rate. In June the Government of India intimated that they were not prepared to adopt any of these proposed courses of action. They submitted, at the same time, a statement of the views expressed by the Ceylon Government on the question. From this it appeared that the Lieut.-Governor of Ceylon was unwilling to exempt Indian tea from the payment of import duty. In their representation the Committee had complained of the heavy transhipment charges at Colombo; and had asserted that it was cheaper in the case of teas destined to Russia for example, to tranship at Singapore. The Ceylon Government denied that the charges were high, but they did not controvert the assertion that transhipment at Singapore was cheaper. They further contended that Indian teas competed on actually level terms with all Ceylon teas which are sold and exported without being blended, or made into packets. It was recognised in Ceylon that the object of Indian growers was to obtain facilities for blending in Colombo. This was considered both by Ceylon planters and merchants to be undesirable; their object being that pure Ceylon tea only should be exported from the island. Looking at the question purely from the Ceylon point of view, but little fault can be found with this decision. But the Committee still think it is unfair to Indian growers that Ceylon tea should be freely admitted into India for blending or any other purposes. For if Ceylon will only admit Indian teas under certain restrictions, it is but right that similar restrictions should be enforced in India against the produce of the island. As matters at present stand, however, there is nothing to prevent the sale in India of blended Indian and Ceylon teas; while the sale of such in Ceylon, or their export from Colombo, is debarred. So far the Committee have not reopened the question with Government, but possibly their successors will consider the advisability of making a further representation.

EXPORT BOUNTY TO ENCOURAGE THE MANUFACTURE OF GREEN TEA.—It is with much satisfaction that the Committee record a considerable advance in the manufacture of Indian green tea during the past year.

Before the end of the season the bounty will have been paid upon 720,000 lb. of Indian green tea. When it is remembered that last season the quantity upon which the bounty was paid did not exceed 30,000 lb. the nature of the advance which has been made will be readily perceived. With the advent of the Cess and the consequent possibility of a bounty on a more extended scale, the prospects of Indian green tea would appear to be distinctly good.

ULLAGE AND DEPRECIATION OF TEA.—The following amended rules for dealing with claims for ullage and depreciation of tea were adopted in May by the Indian Tea Association (London) after consultation with representatives of the Conference Liners, *viz*:—

(1) Metal packages.—No ullage to be recognised unless the fastenings are intact, and unless the metal is perforated. (2) Packages country coopered but not Dock coopered.—No ullage to be recognised. (3) Packages country coopered and Dock coopered. Allowance to be one-half of amount of agreed loss. (4) No claims to be recognised for ullage in respect of packages of Fannings, or Dust Tea, which exceed 110 lb. in weight nett of Dust or 120 lb. nett of Fannings. (5) No claims for depreciation in value to be recognised unless ullage amounts to 10 lb. or over. (6) That any such allowance shall not exceed 1*d* per lb. (7) All claims for depreciation to be accompanied by satisfactory evidence of such depreciation. (8) Minimum ullage to be recognised for any package—4lb.

MAP OF THE TEA DISTRICTS.—In their last Annual Report the Committee mentioned that they were arranging for the compilation of a map of the tea districts. The map was published in September last, and shows the position of all tea estates in Assam and Bengal.

ESTIMATES OF THE CROP.—At the last Annual Meeting of the Association the following resolution was unanimously adopted:—"That in view of it having been found to be impracticable to obtain complete returns from producers, the General Committee be instructed to discontinue the publication of figures relating to the outturn of the crop." The practical effect of this resolution

is that the statistics published by the Association are restricted to those of exports. These are issued in a monthly statement, and include the shipments from Calcutta, Chittagong, and Southern Indian ports.

FINANCE.—The total planted area represented by the Association during the year was 359,206¾ acres, or an increase of 13,439¼ acres on that of the previous year. The year's subscription at the rate of one anna per acre amounted to R22,398-14-3. The revenue account shows a surplus of R2,808-6-9, which has been transferred to capital account. The balance in hand on the 31st December 1902 amounted to R38,177-10-3, less sundry liabilities amounting to R850-15-2.—LOCKHART SMITH, Chairman, Calcutta, 31st January, 1903.

KANDY DISTRICTS PLANTERS' ASSOCIATION.

ANNUAL REPORT, 1902.

MEMBERSHIP.—There are 45 votes enrolled on the Register against 51 last year, the decrease being mainly due to the formation of the Kurunegala Association.

FINANCE.—The financial position is satisfactory showing a credit balance R209·74.

TEA.—The past season has been generally unfavourable both in yield and prices, though the returns during the last few months have improved matters somewhat on low-lying estates. The shot-hole borer appears to be on the increase.

The estimates for 1903 are as follows:—Including 1,626 acres at 400 lb. per acre=650,400 lb. Estimated for ten estates which have not sent their returns.

Total acreage of Tea	..	12,780	
,, Bearing	..	12,391	
,, Crop	..	5,004,050 lb.	} 450 lb. per acre.
,, Green Tea	..	684,800 ,,	}
,, Native Leaf		555,000 ,,	
Total acreage abandoned this year	..	203 ,,	

The figures of Green Tea are not, however, considered very reliable.

COCOA.—Crops have been very good, but the continued wet weather prevented estates unprovided with artificial drying apparatus from curing satisfactorily.

Canker continues to do much damage and no really effectual remedy has so far been found. Estimates:—

Total acreage	...	7,592
Do	...	7,166

Estimated crop 17,490 cwt. (2·44 cwt. per acre.) There are about 412 acres for which no estimates have been sent in.

CARDAMOMS.—This industry has increased considerably of late, with the result that prices have fallen very materially, and it is now proposed to raise a cess of 50 cents per acre with the object of obtaining funds to advertise and push the sale of the product.

LABOUR.—Labour has been scarcer this year than it has been for some time past, and advances are steadily moving upwards instead of being reduced, so that the Labour Federation has not been successful in accomplishing what was hoped from it. This Association considers that Mr. Westland's scheme for recruiting labour from the coast should be given a trial.

Mr. HARRY CREASY'S proposed amendment of the Cooly Labour Ordinance has the same end in view of reducing advances, but as the Sub-Committee of the Labour Federation of the Parent Association deprecated further cooly legislation no further action is considered advisable.

CEYLON PLANTERS' RIFLE CORPS.—The numbers of this Corps have increased during the past year, and the total is now 790 against 536 previously.

COCOA-STEALING LEGISLATION.—His Excellency the Governor has stated that he is unwilling to take any action until another Commission is appointed to re-investigate the matter. This Association would respectfully express its opinion that the cocoa planters have already made out a good case, and that their demand is a perfectly just and equitable one, and hope that Government will see its way to yield on the point.

TEA CESS.—The present statistical position of the tea industry is more favourable than it has been for some time past, and the estimates of this season show a probably considerable decrease in the amount of tea to be put on the London market, due largely to the growth of the green tea industry, and this Association is therefore of opinion that it would be inadvisable to do anything at this juncture to check the expansion of the green tea industry, and therefore recommend the increase of the Cess as suggested by the Thirty Committee, on the understanding, however, that the Cess shall not be continued longer than really necessary to put the new industry on a sound footing. This Association does not approve of the proposal that a petition be made for a Government grant.

THIRTY COMMITTEE.—This Association consider it is impossible for those outside the Committee and not thoroughly cognisant with all the details that have been discussed to pass reliable or accurate criticism on its working and decisions, and they therefore recommend that the best course is to elect the best men available and leave them a free hand.

KANDY HOSPITAL.—The Association considers that the medical staff of the Kandy Hospital does not meet the requirements of the district, and that a large staff should be maintained for so important a centre as Kandy.

A vote of thanks is due to the Parent Association for allowing them the use of the rooms in the Victoria Commemoration Buildings during the past year.

ARE MELONS FRUIT?—The other day a man was asked whether a melon is a fruit or a vegetable. This enquiry led to the further question as to what is the difference between fruits and vegetables, any way? For the benefit of those who do not know, the statement is made that fruit is the part of a plant which contains the seed; but the plant itself is a vegetable. Apples, berries, melons, pumpkins, tomatoes, and the like are fruits; cabbages, radishes, beets, greens, turnips, and the like are vegetables, because it is the plant that is eaten, and not merely the part which contains the seed.—*Journal of the Department of Agriculture of Western Australia* for January.

THE NEW PHOSPHATE MANURE.

(From Mr. John Hughes.)

Dundee, Jan. 20.—I am up here to explain at the *annual* meeting of the Dundee Farmers' Club the properties and advantages of the New Manure Basic Superphosphates which has attracted a good deal of attention and has been specially successful in Scotland where the soil is generally deficient in lime and the period of active growth limited to a few months in the year. Already the manufacture has mounted up to over 1,500 tons during the last year alone and during the coming year the demand is likely to be quite double the above figures. Some has already gone out to Ceylon in compound manures for tea, also 100 tons to Jamaica, 50 tons to Adelaide, 20 to Demarara and some to the Cape.

(Editorial Remarks.)

Less than a generation ago the farming ranks provided some of the most unresponsive audiences for the man of science, especially when the subject down for exposition was only feebly in touch with the affair of rent paying. If Mr Hughes, who lectured so clearly and with such hearty acceptance yesterday evening to the members of the Carse of Gowrie Farmers' Club, had made his discovery of basic superphosphate in the eighties, instead of some two years ago, he would have run the risk of being for a time at least a voice crying in the agricultural wilderness. Without a doubt the world is making advances. The constant small rain of educational agencies and the ever-widening stream of knowledge founded upon experimental science must needs liberalise the world and give increasing clearness of outlook to all those who would as much as possible translate thought into action. When Liebig dissolved bones with vitriol in order to make the resulting compound useful for plant life he was probably classed by some as a visionary, but when he was rapidly followed by Sir John Bennet Lawes the world 'caught on,' to use the popular phrase. The super-phosphate by whose means Sir John worked into a handsome fortune is now, however, in some small danger from the 'basic super,' which is nothing more than the old 'super' with enough of added lime to render it alkaline. Already the prospects for the new phosphatic compound are highly favourable. It is making bold headway in the early stages of 'life' without undue puffing and log-rolling aids.—*Dundee Advertiser*, Jan. 21.

ADDRESS ON THE NEW PHOSPHATE.

Mr Hughes, who was most cordially received, began his remarks by referring to the early experiments conducted by the late Sir John Bennet Lawes in treating mineral phosphate of lime with acid in order to make the resulting compound more or less available for plant food. The acid-treated phosphate, or superphosphate as it came to be named, came to be most extensively used, especially for root-growing. Over two years ago Mr Hughes began to experiment with high class superphosphate by treating it with certain proportions of lime, his object being to produce a phosphate high in solubility and with an alkaline instead of an acid reaction. The result was the substance now known as basic superphosphate—a very light, dry powdery substance, occupying fully 2½ times the bulk of ordinary basic slag. In chemical composition the new phosphate contains 25 to 27 per cent phosphate of lime, which, though not soluble in water, is readily soluble in the acid juices of the plant roots. Mr Hughes explained that the new manure contained from 33 to 35 per cent of lime in combination with phosphoric and sulphuric acid. The great advantage of the basic superphosphate, Mr Hughes claimed, is that it is ten times more soluble than slag, the figures being 66·8 against 6·6 per cent. Treating the basic super and the slag with a very weak solution of citric acid, Mr Hughes found than 94 per cent of the former had dissolved against fully 38 per cent of the latter. The soils most suitable for the new manure were those naturally deficient in lime. It was specially useful on peaty and cold stiff soils, and had already proved of great advantage to soils subject to finger-and-toe. As for times of sowing, November till February were suitable, but it could be drilled in along with the crop in spring, a fair dressing being 3 cwts. per acre. Mr Hughes claimed that the new phosphate was a great improvement upon slag in rapidity of action, while its alkaline nature gave it an advantage over superphosphate, especially where land was deficient in lime or given to souring. The lecture, which was of a most practical and interesting nature, was followed with great closeness, and at the end Mr Hughes was heartily applauded.—*Ibid.*

A POT OF BASIL AND MOSQUITO PREVENTIVES.

Mr. A. E. Shipley's interesting article (p. 205) on *Ocimum viride* and its influence on mosquitoes recalled some observations that I made upon the papaw tree (*Carica papaia*) in China. My house, on the bank of the river at Whampoa, near Canton, was singularly free from mosquitoes, though the other houses on the same island were more or less infested with them. A line of papaw-trees, stretched between my house and the river, I frequently watched these trees, yet I never saw a single insect alight on them, though flies and other insects settled in numbers upon the bamboos and banana-plants not far away. In fact, the papaw-trees seemed to keep insects at a distance and to act as a rampart guarding the house from mosquitoes. The probability of this suggestion was considerably strengthened by the increase in the number of mosquitoes entering the house after a typhoon had blown down two papaw-trees and thus made a gap in the row, and by the still further increase when a second typhoon felled another of the trees. I have questioned a number of persons living in the tropics, and one of them stated that he was familiar with the fact that papaw-trees repelled mosquitoes.

That the papaw-tree possesses some curious property—in addition to the notorious proteolytic action of its juice—is suggested by the widespread practice of hanging meat in its shade to render the meat tender. The custom is frequently regarded as a senseless one, but its wide distribution causes one to ask: is it not possible that the papaw-tree should exhale a gaseous product which either repels meat-destroying insects or exerts an antiseptic action on putrefactive bacteria, or, finally, is a volatile ferment? The peculiar relation in regard to temperature displayed by the proteolytic ferment of the papaw juice renders the last possibility less improbable than at first impression.

—*Nature*, Jan. 22. PERCY GROOM.

COCOA IN TRINIDAD.

(*By W J S Tucker.*)

WEATHER.—The weather during the greater part of the past fortnight has been rather too wet for this period of the season but for the past two or three days there has been a change for the better, and, with a continuance of dry weather, it is expected that Sugar making will begin about the middle of present month.

COCOA.—The wet weather mentioned above has interfered somewhat with drying operations, and this will probably affect receipts for the early part of present month, but we look for large receipts from that date onwards. We quote prices today at $12.50 for Ordinary and $12.75 to $13.10 for Estates.

My artificial Cocoa Dryer is used on several estates in the island and thoroughly removed all trouble in drying the cocoa during heavy rainy weather.

PRODUCE SHIPPED TO 30TH DECEMBER 1902.

Years.		Cocoa. lb.	Coffee. lb.	Coconuts. Number.
1899	...	24,743,860	10,880	11,545,880
1900	...	29,465,752	7,220	8,316,256
1901	..	21,137,304	20,880	11,265,876
1902	...	32,123,540	39,900	11,902,156

PROGRESS IN BRITISH GUIANA IN 1902.

The Report on British Guiana in 1901-1902 was issued on Wednesday in the annual series of colonial reports as a Parliamentary paper [Cd. 1,388-2]. In the general review of the condition of the colony, perhaps the most interesting observations are those on the position of its sugar industry. Towards the end of 1901 the price of sugar reached the lowest point ever recorded, but the conclusion of the Brussels Convention has done much to relieve the feeling well nigh of despair that had come to those interested directly or indirectly in the industry.' The crisis is by no means over and a period of struggle must still be looked forward to, but it is confidently hoped that the Sugar Convention will in time restore public confidence in the industry and secure for it the capital which it so much needs. Meanwhile, a scheme of experimental cane cultivation is being worked out and is in process of extension over the sugar estates, where over 6,000 acres are now being utilised for cultivating new varieties. The general area under cane increased from 67,884 acres in 1900 1901 to 72,148 in 1901-1902. The Government of the colony recognizes fully the need of encouraging agriculture of every kind, and a Board of Agriculture has been constituted with the object of promoting the cultivation of the many tropical, agricultural, and horti-agricultural products which can be grown in British Guiaua, the spread of agricultural knowledge, and the improvement of the breeds of live stock in the colony. There has been a steady development of the rice industry since it was first seriously taken up about seven years ago. While the local consumption of rice remains the same, the quantity of imported rice has decreased notably, and the colonial industry seems to have established its position. The cultivation of products other than sugar cane has been greatly furthered by the more liberal land legislation begun in 1890, which has enabled the people to settle on the Crown lands of the colony and take up largely increased areas for development. This desirable movement is still going on. The output of gold during the year—all of which was produced by alluvial working—fell to 101,332oz. from 114,102oz., the figure for 1900 1901. The decrease is attributed partly to the diversion of activity towards diamond seeking and partly to the more or less continued heavy weather. Diamonds to the total weight of 8,227 carats were found during the year, 91,206 stones being registered. In the previous year 4.981 stones only, weighing 740 carats, were registered as found. Maps, accompanied by short explanatory pamphlets prepared by the Government geologist, have been published, and illustrate the general structure of the chief gold and diamond fields of British Guiana. The work of demarcating the boundary with Venezuela was continued during the year. Some 300 miles remain before Mount Roiaima, the terminal point, is reached, but as the country now to be traversed is less difficult future progress should be more rapid. The most friendly relations were maintained between the Commissioners of the colony and those of the republic.—London *Times*, Jan. 16.

PLANTING NOTES.

THE SUPPLY OF BALATA—in sight is said to be so great that no fears of a shortage need be entertained for years to come, if the business is properly and intelligently handled. Experts report that there is not a tributary to the Amazon which does not show forests of this tree upon its banks. The importance of this new industry in Brazil may be realised when it is known that the market price of balata is equal to that of the best rubber and the cost of production is less than one-tenth that of rubber. Balata has another advantage in that it does not necessitate the risk of life attendant upon the gathering of rubber. The balata grows upon high ground, as well as on the margins of the swampy streams. where the fevers lurk. It is a common saying in Para that every ton of rubber from the upper river costs two lives. This can never be said of balata, for men work at this industry with no greater risk than usually attends any labour in the Tropics; and four men will gather as many kilograms of balata per day as thirty men can obtain of boracha.—*India Rubber Journal*, Jan. 5.

FRUIT AND ALCOHOL.—The more fruit you eat the less alcohol you will need. In the first place, the amount of water in fruit is considerable. In water melons it is no less than 95 per cent ; in grapes, 80 per cent ; in oranges, 86 per cent ; in lemons, 90 per cent ; in peaches, 88 per cent ; in apples, 82 per cent ; in pears, 84 per cent ; in plums, 80 per cent ; and in strawberries, 90 per cent ; not a fruit in the whole category containing less than 80 per cent. The irresistible conclusion, considering these facts, is that fruit plays an important part in diet as a thirst quencher. Certainly when fruits are freely represented in the diet less fluid requires to be consumed ; and fruits would appear to be endowed with a subtle inimitable flavour which is ample inducement to imbibe fluid in this most wholesome form. The question so prominent in most people's thoughts as to what to drink might therefore, on sound physiological reasoning, be answered : eat sound, ripe, juicy fruit. It is noticeable that as fruit enters into the diet the indulgence in alcoholic drinks is undoubtedly very much diminished.—*Exchange.*

Correspondence.

To the Editor.

TRAWLING IN CEYLON.

Jan. 27, 1903.

DEAR SIR,—I see Dr. Gandevia has been writing rather strongly on the trawling question in Ceylon. His first contention that trawlers do not place on the world's market an abundant and constant supply of fresh wholesome fish at a cheap price, is, however, open to doubt. At Grimsby, Hull, and Aberdeen, three, if not the greatest, at least among the greatest trawling centres in the world, the past year has not been attended with the same prosperity as in past years. This is not accounted for by competent writers and experts on the subject as due to a scarcity of fish. Fish were plentiful, but trawlers were too numerous, the supply was too abundant and the prices consequently unremunerative. The picture of thousands of "devastated" villages is, from my little experience, considerably overdrawn; in fact the seven-mile limit to British Trawlers has proved quite sufficient to protect the coast line fishermen at home, and were the Danish and Norwegian Trawlers not permitted (by the North Sea Convention, I think) to lower their beams as close as three miles off the coast there would be little cause to complain. By all means protect the foreshore fisheries in Ceylon, but let the protection be reasonable. Five or seven miles would be ample in my opinion as a reserve for the line fishermen. If the trawlers do not go raking along the spawning beds, I do not think the churning of steamer screws will frighten the fish away. Dr. Gandevia's object is praiseworthy enough, but I do not think Government should, without expert advice on the matter, do anything to crush the life out of a new industry by making the conditions of its prosecution impossible without being thoroughly satisfied that the industry is injuriously affecting the coast fishermen's interest.—Yours, &c. SEER.

SIR,—Dr. Gandevia's letter in one of your numbers, regarding Trawling in Ceylon is deserving of attention. Facts are what is wanted and sayings and assertions are to be taken for what they are worth. Not long ago dead fish was washed ashore, and it was found that the fish caught by trawling was more than could be cured or preserved, and the rest was thrown overboard. Surely this is not a desirable proceeding to destroy fish which could be fished by villagers on the coast. To destroy the food of man for the benefit of a few speculators is not a matter to be encouraged.

In the North-East monsoon there is an abundance of fish near the coast, and most likely it is due to the smooth sea at that time of the year and the abundance of food for fish washed down from land by the burst of the North-East monsoon. If such is the case, it is a pity that fish should be prevented from coming near land by trawling a few miles from the coast.

As we have laws for the protection of land animals by game laws, why should not there be the same protection for fish on the coast, to prevent fish being caught and destroyed because the catch is in such abundance that it could not be preserved. To my mind, trawling should be allowed during the South-West monsoon from April to November, and for the four months from December to March it should be disallowed. This will give the fishermen on the sea coast the benefit they need and the trawler, his share as well.

To allow trawling all the year round, would impoverish the inhabitants along the sea coast, whose trade is in fishing, and also affect the spawning. These are matters which deserve careful attention as it may lead to crime, poverty and to the restriction of a fresh fish diet, and to encourage a badly-cured fish one. The appended extract will show the distress caused in fishing villages when deprived of their living.—Yours truly,

TRUTH.

TROUBLED FISHERFOLK.

London, Jan. 13.—Forty thousand fishermen on the coast of Britanny have been deprived of their means of livelihood, owing to the disappearance of sardines from the adjacent waters of the English Channel and the Atlantic Ocean. Great distress consequently prevails among the residents of the coastal districts.—*Australian paper.*

TOBACCO IN INDIA AND IN CEYLON.

Feb. 4.

DEAR SIR,—I rather like a weed—I mean between the lips, and not on the plantation; but I don't see why I should pay more for a cigar than my brother in India. I found the other day in the *Indian Planting and Gardening*, a protest against the prices put on Indian cigars by the three leading manufacturers there, while their quality has been deteriorating. On that point I do not wish to say anything; but the writer speaks of a box of a hundred Manila or Havana cigars being available for R4·50 to R5, and of Loudres at R6. How is it we cannot get these brands in Colombo at these prices? Is it that the duty here is heavier than in India? Or is it that our shopkeepers have forgotten to alter the prices which they had arranged in combination, when the rupee was worth only thirteen pence? This forgetfulness extended to other articles as well, until some Cash-stores were started. Can no one start cigars at reasonable prices?

SIXTEEN-PENCE.

[Imported cigars pay R1½ per lb. here. In India 5 p.c. *ad valorem*.—ED. *T.A.*]

OVER-PRODUCTION : NOVEL PROPOSAL IN BRAZIL.

Feb. 5.

DEAR SIR,—Enclosed is a cutting from the *Financial Times* of 10th January. What about the over-supply of Cardamoms being treated in some such manner?—Yours truly,

VISITOR.

(Extract referred to.)

TWO BIRDS WITH ONE STONE.—A Committee recently appointed by the Agricultural, Commercial and Industrial Society of San Paulo, in Brazil,

to inquire into the causes of the fall in the price of coffee has just issued its report, in which a number of measures for reducing the output so as to establish an even balance between production and consumption are proposed. In consequence of this report the Brazilian Government now contemplates placing a duty of 20 per cent on all exports of coffee, which is to be exacted in kind. The berries thus taken in taxation will be "denaturised" and sold to the planters as manure. By this means exports will, it is estimated, be reduced by one-fifth, and values will rise accordingly. That the theory will work out so smoothly in practice is another matter. But certainly as a fiscal expedient the proposal is ingenious.

LONDON SALES OF CEYLON RUBBER

London, E.C., Jan. 23.

DEAR SIR,—At our auctions today the following lots of Ceylon-grown Para rubber were offered and sold:—

Mark.		*per lb.*
Eadengola	... 3 cases Fine thin biscuits	at...4/2¼
Hatherley	... 1 case Very pale yellow do.	at...4/2¼
Culloden	... 6 cases Fine thin biscuits	at...4/3
Do.	... 5 cases Negroheads	at 3/3 & 3/4½
Clyde Estate	2 small lots Fine biscuits	at...4/2¼
Do.	... 2 small lots Negroheads	at ..3/2
Nikakotua	... 2 cases Fine biscuits	at...4/2¼
Do.	... 1 case Negroheads	at...3/2½

As we think these particulars and prices of Ceylon-grown rubber will be of great interest to many Ceylon planters, we suggest your printing same in your next issue.—We are, dear Sir, your obedient servants,

LEWIS & PEAT, Brokers,

HUNTING IN THE HILL DISTRICTS.

(To the Editor, Local "Times.")

SIR,—You called upon me for an exhaustive reply to Mr. North C Davidson's letter published in your columns some two weeks ago, on the subject of Game Protection and the "Hill Districts." I am afraid I have no time for that, but as Honorary Secretary of this Society, I suppose, I ought to take some notice of his remarks upon the rule prohibiting the shooting of sambur above 4,000 feet elevation, and of the blood-and thunder paragraph about registered packs. The history of this rule which has been exercising the minds and pens of a few people lately, is as follows:—

About four years ago licenses to shoot sambur in the hill country around Nuwara Eliya were issued on such a lavish scale that any common cooly or kangany who applied for one could have it for R3·50. The number of licenses then issued from the Kandy and Nuwara Eliya Kachcheries was very large, and as one license serves for at least 20 persons where coolies are concerned, gang hunting was carried on openly, two, three, and four-days a week! On the Bopatalawa and the Digame Patanas—on the Elk Plains from Black Pool to Ambawella and from Ambawella to the Agra Patanas, on the Rajah Patanas, and in all the open patana and forest within a few miles of Nuwara Eliya, in the Ohiya forests and patana—in Gallagamuwa and all the intervening forest right to the Bagawantalawa estates in Boltumbe and Bambarakotuwa well into the Peak range and the Maskeliya estates, sambur were killed wholesale by estate coolies. It was at that time no uncommon occurrence to see gangs of coolies, aggregating 50 to 60 persons, with dogs and guns, hunting in the Bopats and Digames and other well-known hunting grounds. The results of all this was almost extermination in the tracts of land I have named, and two years ago all the old well-beaten game paths there were grown up and indistinguishable, and hardly a sambur was to be found for miles around. The rule, however, prohibiting shooting, which instructed the different Government Agents not to issue licenses to shoot sambur, eventually made itself felt, and the old haunts are gradually being reoccupied by game. On the Horton Plains and Aldie Patanas, where shooting has never been allowed at any rate for the last 15 or 20 years, and sambur are hunted only by hounds to the knife, a large stock of these animals has always existed and still exists to this present day, in spite of so-called slaughter, and no country has been hunted harder by packs of hounds.

As to the killing of hinds, this has always been found necessary in Scotland's on deer forests; and in England, wherever the wild stag breeds; and a little judicious thinning out in Ceylon is equally advisable. Now, if Government can be persuaded to issue licenses to shoot in the Hill Districts to Europeans only, and absolutely refuse them to all others on any pretext whatever, no harm will be done, and this outcry against the existing rule would cease at once. Fair stalking with the rifle on all the patanas I have named would be quite a legitimate form of sport and would afford much healthy exercise to sportsmen; but it would, I fear, puzzle our game-watchers to determine whether a dead sambur had been fairly stalked or shot over dogs like a hare.
—Yours, &c., THOS. FARR.

Ceylon Game Protection Society, Feb. 7th, 1903.

REVIEW OF THE CRUDE RUBBER MARKET.—Rubber production, says the *India Rubber World*, for January 1, not only is not showing the rate of increase maintained for several years up to 1901, but this year will show a material decline. Meanwhile the rubber manufacture in every country in which it has been established has been active, there having been in no country such business conditions as have lessened the demand for rubber goods except, perhaps, in Germany, where the manufacturers have been able through their growing export trade to off-set any check in the trade at home. There is nothing in the conditions outlined above to point to the limit of rubber production having been reached. On the other hand, facilities for reaching the remoter South American fields are being improved all the while, even if slowly, and the tendency is toward the better conservation of native supplies there. The decreased output from the Congo districts has been due in part to a deliberate policy of the rubber trading companies which, for some time, have seen their earnings suffer through the careless handling of their rubber products, of devoting their energies to the better preparation and more careful shipment of rubber, rather than to getting out the greatest possible quantity. It appears now as if manufacturers would have to adapt themselves to a condition of rubber practically as high priced as at any time of considerable duration in the past, in connection with which no promise exists of an early decline in the cost of the other raw materials which enter into their products.

PLANTING ON THE ANAMALAIS.

We were pleased to learn today from Messrs. Martin and Bannatine, how well the new planting district—fostered by Sir Arthur Havelock when Governor of Madras—is developing. Out of 15,000 acres taken up, about 3,000 have been opened in tea and coffee with cardamoms, cinchona and some rubber. The plantations run from 3,000 feet upwards. A cart road is already right into the district. Calicut is the port; but Madras will have to be utilised for the S.-W. monsoon part of the year. The railway is coming nearer. Mr. Martin's tea of good jât has made splendid growth and a factory is now being built. Not a few still believe in coffee, if only prices would keep up. Cardamoms do well, but get a wintering; and produces expected to be all sold locally. Cinchona trees (from 15 p.c. Java seed) are growing well; and Para rubber in the flats has made growth equal to 6 feet in six months. Altogether therefore, Mr. Martin has reason to be satisfied with the inspection from which he has returned;—nor are the eight Anamalai planters now at work afraid about a labour supply.

GREEN TEA.

We hear of a sample of St. Leonard's green tea, spoken of very highly by an expert, as equal to the very best China of the same class. This is good testimony to the patent process of Messrs. Heath and Wiggin.

COCOS ISLANDS.

WHERE IT IS FASHIONABLE TO DANCE IN BOOTS!

The annual visit to Cocos Islands, which are under the paternal rule of Mr George Clunies-Ross, was paid this year by Mr L H Clayton, district officer at Christmas Island.

Mr. Clayton found nothing of importance to report, but there are one or two very suggestive passages in his remarks. For instance, he tells us of a severe cyclone that visited the islands when all the inhabitants ran into the lagoon up to their necks to escape the falling trees. There seems to be a novel view held concerning the value of boots. The winners of a race were offered as prizes their choice of a piece of serge or a pair of boots. They chose the serge as the men explained that boots were of no use except to dance in!

Mr Clayton visited North Keeling Island where every tree and bush is covered with the nests of frigate-birds, boobys, gannets, terns, &c. The birds are quite tame and have no fear of man. The white tern, Clayton thinks, is the prettiest of all. Mr Ross showed him one of this bird's eggs *in situ*. It had been laid so as to rest between two ribs of a coconut leaf, and was so placed that the swaying of the leaf in the wind did not shake it off. There was no nest of any kind.—*Commercial Intelligence*, Jan. 22.

MOSQUITO BLIGHT ON INDIAN TEA.

Mr. Harold Mann, the scientific Officer of the Indian Tea Association, has left Calcutta to spend six weeks in the tea districts making further investigations into the mosquito blight. Problems in the manufacturing of tea are to be taken in hand on his return to Calcutta. A further monograph on tea soils will be issued shortly.—*M. Mail*, Feb. 13.

PRODUCE AND PLANTING.

It is somewhat curious to notice the way in which fads are ministered to by public caterers. A correspondent informs us that on visiting one of the co-operative stores he noticed on the menu that

TEA COULD BE HAD AT 2D. PER CUP.

This, he presumed, was ordinary Indian and Ceylon tea. China tea could also be had, but this being an article likely to be asked for by faddists, was marked at 3d. Our correspondent asked the distinction between the two. and was told that the China tea was a special scented sort, and very delicate in flavour. This need not frighten producers of Indian tea any more than the advice given by the late Sir Andrew Clark to his lady friends to drink only China tea. For the present day economic reasons prevent the majority of people from indulging in drinks that cost 50 per cent. more than they have been accustomed to pay. It is only right, however, that those who call for special brands should be prepared to pay something extra for the gratification of their tastes.

The *Grocers' Gazette*, commenting on the

A NEW USE HAS BEEN FOUND FOR TEA

according to the British Consul at Bordeaux who reports that he is informed that tea is largely used to colour brandy, the tannin giving the brown appearance like that produced by long storage in oak casks. —With regard to

DISPUTED BIDDING AT TEA SALES,

the "Grocer" says: "Friction has been experienced for some time past at the tea sales owing to certainty as to whether bids of ½d per lb are to be allowed. The present rule is to advance by farthings. Competition, however, for the lower grades of leaf tea is generally very keen, it being the desire of every buyer to get his bid accepted by the auctioneer, and in the shouting that always occurs with active markets, everyone yelling out at the same time, it is difficult for auctioneers to do justice to all bidders, which naturally causes great dissatisfaction. On these occasions a buyer is often prompted to offer ½d per lb. more. Many breaks are divided into two lines, and the buyer then offers a ¼d more and 'drop'; or if the break is in only one line suggests that it should be divided, and he will give a farthing advance and drop which works out the increased equivalent of ½d per lb. This innovation is resisted by some brokers for reasons of their own, and objected to by others on the ground that it is irregular, whilst there are auctioneers who refuse these ½d's at the public sales, but accept them privately. At the Indian auctions last Wednesday a definite ruling was asked upon the subject by more than one buyer, but only the usual stereotyped answer was forthcoming, which means that the matter remains as it did before. It is a great pity that brokers cannot come to a decision among themselves, as the uncertainty engenders a good deal of vexation and irritation between buyers, besides often rendering the sale-room the scene of most disorderly proceedings. But those auctioneers who present a firm front and back their own decisions invariably command attention; it is the vacillators who fail to keep order."—*H. & C. Mail*, Jan. 23.

CEYLON TEA IN RUSSIA.

Our Odessa Correspondent writes:—The Colombo representative of a group of Moscow tea merchants states that the export of Ceylon tea last year exceeded by 2,000,000lb. that of the previous twelve months, and the trade is increas-

ing with marvellous rapidity. In this country Ceylon tea finds a constantly enlarging market, and there is, in consequence, a steady decline in the import of the Chinese product. Several of the leading Moscow merchants, I am credibly informed, have expressed the intention of shortly severing their connections with the Chinese planters in favour of the Cingalese growers.—London *Standard*, Jan. 30.

A NEW METHOD!

We have before commented on the extraordinary statements which appear from time to time in the public Press with regard to rubber. The following paragraph is the richest in humour which we have yet seen. It has started its rounds, and sooner or later will appear in different parts of the world:—"American ingenuity has devised several new methods for getting rubber ready for the market. The milk is drawn from the bark by suction, so that the pure sap is obtained free from the grit, bark, and foreign substances which were always present in such large quantities in the rubber sold by natives. After the rubber milk is obtained the pure rubber is separated from the other ingredients of the sap in much the same way that cream is separated from milk, by a patent process. In the new method introduced and practised by the Americans there is no waste of sap. By the natives half of it is wasted. When the rubber is coagulated it is tied up in bales and shipped to New York, where it sells at from 75 cents to 1 dollar (gold) a lb, and the total expense of extracting it, separating and coagulating it, and shipping it to the Eastern market is not more than 5 cents a lb. This shows enormous profit."—*India-Rubber Trades' Journal*, Jan. 19.

MR. H. H. MANN'S TEA INVESTIGATIONS.

A letter, dated 24th January, from Mr H H Mann, the Agricultural Chemist employed by the Association, stated that he proposed to go on tour on the 9th February, in connection with his experiments against Mosquito blight. Mr Mann also asked the Committee to decide whether, on the completion of this tour, he should work up the soils of the Dooars and Darjeeling Districts, or whether he should continue his work on manufacture. The point was carefully discussed by the Committee, who were of opinion that the investigations into manufacture were the more urgent, and should take precedence over the soils of the two Districts named.—*I. T. A. Minutes*, Feb. 6th.

THE PLANTAIN FIBRE BOOM IN MALABAR.

Calicut, 12th Feb.—A correspondent writes to the *Kerala Sanchari*, the leading vernacular paper in Calicut, to say that a friend of his recently extracted a quantity of plantain fibre and forwarded it to Messrs Eddie and Christy, of London, who valued it at £15 per ton, and also wrote to say that they would give £25 for superior quality of fibre, and were prepared to receive supplies to any extent. Now that a fair start has been made, the opportunity ought to be seized by wealthy Malayalis—and there are several whose ancestral wealth is rusting in disuse—to launch what promises to be a remunerative industry. The plantain tree is about the most familiar feature in the sub-arborescent vegetation of the Malabar Coast, and the raw material for the fibre is to be had in abundance.—*Madras Mail*, Feb. 14.

POPULAR SCIENTIFIC LECTURES.

"THE PECULIARITIES IN ANIMAL LIFE IN CEYLON."

(Special.)

The fifth lecture of the series of Popular Scientific Lectures was delivered in the Ceylon Medical College on Saturday, 14th February, by Dr Arthur Willey, the Director of the Colombo Museum. The lecturer first dwelt on that remarkable peculiarity in the fauna of Ceylon first noticed, we believe, by Sir Emerson Tennent viz:—that Ceylon fauna consisted partly of Indian and partly of Malayan and Australian types and—what was more remarkable—were wanting in types which one would certainly expect to meet; as for instance the hamadryad or king-cobra, the tiger, and the antelope. Afer a brief reference to the Singha or lion in Sinhalese Mythology as being significant of the alien source of the Sinhalese race, the lecturer, with the aid of lantern slides, spoke first of the larger animals such as the leopard, and the various deer found in Ceylon, one species of which, whose headquarters are in Northern India, tradition ascribes as having been introduced by the Dutch, though no record has been found referring to such introduction. He then dwelt on the different lizards including the chamelcon, the rare ceratophora or horned lizards found upcountry, and the false snakes or underground lizards. The next branch to be taken up was that of the fishes when the audience were entertained by descriptions of the burying fish like the "Lula" which lies dormant for a long time in dried up tanks waiting for the next rainy season; of the travelling and climbing fish, one species of which may be found in Mount Lavinia climbing on the top of rocks while another may be met with walking along the wayside or even climbing trees; of the king-crab "the last of the Mohicans," a crustacean of ancient lineage one who can trace an unbroken descent from ancestors living in times long before the advent of that parvenu, Man; and of the erect swimming fish or fish with its dorsal aspect like the back of a razor and its ventral aspect as sharp as the front of a razor—a blunt razor. Dr Willey then turned his attention to those two low marine organisms on the life history and development of which the lecturer may be described as an authority; viz. the Amphioxus and the Balanoglossus. He impressed on his audience the importance of these two organisms lying as they do on the border land between the vertebrates and the lumbricates or earth worms—the highest form of invertebrates; for it is held by most scientists that the evolution of the vertebrates proceeds from the invertebrates through the Amphioxus and Balanoglossus. Dr. Willey here showed some splendid slides of the development of the Amphioxus and Balanoglossus, photographs taken evidently from his own excellent set of specimens. The next subject dwelt on was the Molluscs where the audience were shown some beautiful slides of the Pearly and the Paper Nautilus, the shell of the former of which is to be found occasionally in Trincomalee, though

strange to say only three living specimens have so far been found. The last class to be taken up was the Myriopedes, consisting of the centipedes, of which a specimen of the very venomous yellow and black species was shown on the screen; and of the harmless Millepedes, met with so often upcountry. Dr. Willey also mentioned the existence of a third order belonging to this class (Poropidæ ?) a few species of which are to be found in Australasia and South Africa. This third order was of interest in that it lay between the earth-worms and the centipedes. It was also of special interest to the Zoologist on account of its methods of reproduction; one species resembling the Mammalia in that respect while another was possessed of an enormous nutritive sac which sufficed for the nutrition of the embryo.—It was evident that Dr. Willey is of opinion that this third order may exist in Ceylon though it has not yet been found.—The lecture terminated shortly after 10 o'clock, Dr. Perry proposing a vote of thanks to the lecturer, for the very interesting lecture he had delivered, in which he had in such a short space of time, been able to give them such a fund of information about the peculiarities in animal life in Ceylon.

COCONUT PLANTING.

SIR,—In one of the most fertile islands of the Godavery I own land on which I planted a coconut tope three years ago. The land is very near the banks of the river, whose water is saltish, owing to its proximity to the sea into which it empties itself. The soil is one on excellent black loam and is, in the opinion of all local planters, eminently adapted for the growth of the coconut palm. So far, the plants, too, are thriving admirably, and if everything goes well with them, will yield fruit in three more years' time. A few days ago I paid one of my occasional visits to the place to see how the plants were progressing. Among others of the village who came to see me was an old experienced planter, who told me the following startling story. It seems he has land in another part of the village, very near mine, where, by the side of a large coconut plantation of his, growing and fruiting since his grandfather's time, he planted another some years ago. The plants grew very vigorously till they were just about to bear fruit, when, from some unknown cause, all of them suddenly drooped down their heads, and died within a short interval of each other. He suspected there was something wrong about the soil (which, by the way, was covered with a deposit of white sand, the result of a recent inundation of the river) and which he replaced about a yard deep with a soil and manure believed to be favourable to the growth of the coconut; and planted another tope, which also shared the same fate, having come out splendidly till the time of the promised fruit and perished equally miraculously. Nothing daunted, the old planter tried various means to eliminate the causes of the evil so far as could be conjectured, and successively altered the manure, the water and other things which might influence the health of the plant one way or the other. But with the same unfortunate result throughout. Now he has given up all thought of remedying the evil, which he attributes to parasitic worms sapping the life out of the plant from behind the root. Against this, too, he wished to provide by pouring in kerosine oil, but whether this tended to kill the plant instead of the worm I am not sure. Now, in the interests of all local planters, I write this to you in the hope that you or any of your numerous readers will kindly enlighten me as to what conclusion to draw under the circumstances, and what measures to adopt in order to remedy the evil or effectively prevent it before having to attempt a cure.

9th Feb. COCONUT-PLANTER.

—*Madras Mail*, Feb. 12.

MALARIAL FEVER AND HOW TO PREVENT IT.

A CIRCULAR IN THE NORTH-WESTERN PROVINCE.

Mr. S. M. Burrows, Chairman of the Local Board of Kurunegala, has issued the following circular, at a very opportune time, and it would be well that every recipient do "read, mark, learn and inwardly digest" its invaluable contents, so full is it of wise laws and modern instances. The circular is applicable to all malarial stations, and may, with profit, be adopted by the residents thereof:—

"It is now quite certain that malarial fever is caused by the bite of certain mosquitoes. You cannot catch malarial fever in any other way. How can you avoid being bitten by these mosquitoes?

1. Use curtains (without holes or tears in them) at night to sleep under. They will save you the expense of doctor's bill, and medicines.

2. Empty and throw away or burn all broken bottles, upright pieces of bamboo, empty coconut shells, tins, old buckets, etc., in which stagnant water collects, and fill up all puddles and stagnant pools near your house, and clean your drains. It is just in these places that the dangerous kind of mosquito breeds. If we would all carry out this plan as far as we possibly can, there would be very few mosquitoes left to give us fever.

3. Keep your houses as clean as possible. The mosquito likes dark, dirty corners and shuns light.

4. Take quinine at regular intervals and in small doses, especially during the malarial season (December, January and February). Quinine prevents the fever germs from spreading. It can do you no harm. It can be had for nothing. Why not take it? Everyone in a malarious place like this should take enough quinine to cover a ten cent piece once in ten days even when quite well: If feverish, more frequently. If we all did this, there would be very little fever.

5. Every person with fever should be sent to hospital, if possible. While he remains in the house, the mosquitoes that bite him will bite you and give you fever. Let us all try and act on these simple rules for a year, and see if we cannot make Kurunegala a healthy place."

MALARIAL FEVER.—The circular issued by Mr. S M Burrows and printed in our daily and *T.A.* is well worth the attention of all who reside in feverish districts. Fever has lately been especially trying in and near Anuradhapura, for instance—and this and other places similarly situated will doubtless be glad of good advice.

KURUNEGALA PLANTERS' ASSOCIATION.

ANNUAL REPORT

of the Kurunegala Planters' Association of Ceylon for the year ending February 14th, 1903.

Your Committee have pleasure in submitting the first annual report, and they feel sure that all members of the Association, on perusal of same, perceive that the desirability and necessity for an Association in this district is very obvious, and that the formation of this Association which took place a year ago has already led to beneficial results in the Planting interests.

FINANCES.—Your Committee are glad to be able to report that the finances of the Association are in a satisfactory condition. All liabilities with the exception of cost of recent advertisements have been paid up, there are no subscriptions outstanding, and there is a balance to the credit of the Association of R78·91.

MEMBERS.—There are 28 members on the register—25 estates and three private subscribers—and your committee are in hopes that some more estates in the district, which have not as yet joined, will do so in the coming year.

MEETINGS.—There have been five general meetings and five Committee meetings, and the attendance on the whole has been good.

HOSPITAL.—At an early meeting of the Association it was thought desirable to ask Government to appoint hospital visitors, and Messrs. Scott and Hermon were duly appointed.

LABOUR—on the whole has been fairly satisfactory. There has been trouble on one or two estates, but otherwise relations between employer and cooly have been harmonious and peaceful, and your Committee see no reason why this satisfactory state of affairs should not continue. The advances all over the district (as far as your Committee are able to ascertain) are considerably lower than they were a year ago.

MAIN ROADS—suffered considerably during the last wet weather, but are now being put into good order again as before. A toll on the Kandy Road near Mallawapitiya was removed by Government at the request of this Association, much to the satisfaction of all residents in the district.

MINOR ROADS.—Your Committee regret that they cannot give a good report in this respect, as some of them are in a state wholly unfit for cart traffic; one or two roads near to the town are in a fair state of repair, but beyond that the rest of the district is in a wretched condition. Plank bridges are rotten, culverts are choked up, and in many places no side drains exist at all, and practically no improvement in the way of necessary new bridges, pavings, drains, &c., have been done at all. Your Committee cannot help feeling that the continual change of Government Agents, which has been going on now for the last five years, has had a disastrous effect in this and many other respects regarding the welfare of the province, and they take this opportunity of pointing out the desirability that may arise of publicly discussing this important question, should further changes again take place.

C.P.R.C.—Your Committee note with much satisfaction that a section of the C P R C has been established at Kurunegala, and under the able guidance and command of Mr H E H Hayes has already attained to a very high standard of efficiency, especially so at the range.

POST OFFICE.—Your Committee would call your attention to the wretched little building that is now used as a Post Office, which is wholly inadequate for the work and should receive your attention.

COCONUTS.—Our Association being largely comprised of representatives of the coconut interest, your Committee have much satisfaction in recording another prosperous year for that industry. With the exception of a decline of 65,069 cwts. in copra; a deficit of 2,262,569 in coconuts in the shell, and 6,826 cwts in coir fibre, all the other products reported—coconut oil, 512,498 cwts; poonac, 247,696 cwts; desiccated coconuts, 16,227,565 lb; coir rope, 15,631 cwts.—show an appreciable increase over last year and are the highest during the last 10 years, desiccated coconuts being the highest on record. Our best customer for copra and poonac is Germany; France being next with copra. The United Kingdom takes the bulk of coconut oil, desiccated coconuts and coconuts in the shell. America is our next best customer for coconut oil and desiccated coconuts. India, which last year took 141,139 cwts coconut oil, has this year taken only 64,370 cwts. This great falling-off is said to be due to a tax imposed upon the article in India. Singapore takes 15,354 cwts coir rope, out of 15,631 cwts exported. Prices though not so good as during the closing months of 1901 were fairly satisfactory. Copra ranged from R61 to R63 per candy during the first half of the year; at R56 to R58 from July to October, and during November and December touched R57, the lowest price for the year. Coconut oil varied in the varying prices of copra, and at the end of the year was R4 per cwt., below what it was at the commencement. Poonac was R75 per ton from January to March and stood firm at R80 for the rest of the year. Desiccated coconuts varied from 19 cts. to 22 cts. per lb. Though the fall in prices has been considerable for the last few months, your Committee are hopeful that it is only temporary and will soon rise.

There would seem to be a steady increase, both in Britain and the Continent, of the manufacture of coconut butter, and it is good news that we may shortly expect to see this article manufactured locally. We wish the venture all success, as the demand for coconut butter is sure to increase and be in great request by vegetarians of all creeds. There are rumours that the sensitive plant, which has hitherto been considered a nuisance and source of expense on many estates, is likely to prove a blessing. Being a nitrogen-collecting plant it is being cut down twice a year and buried—with results, it is said, far in excess of what might be expected from its nitrogen-producing propensities only.

Your Committee would advise those who have this plant growing on their property to experiment in this direction with a few acres and report results. The year has been an unusually wet one, causing a deal of inconvenience at times, but upon the whole might be considered favourable for the formation of crop, and the probabilities are that 1903 will be a good year in this respect.

COCOA.—Throughout the district cocoa is doing well and cancer (as far as your Committee are able to ascertain) is not at present causing much anxiety. Crops were fairly heavy and realised on the whole good prices.

OTHER PRODUCTS: RUBBER, PEPPER AND VANILLA.—From the results obtained from various estates it would seem that this district is very suitable for the growth of any of these products and a considerable acreage is now planted and being planted with them.

THE RUANWELLA TEA COMPANY, LTD.

ANNUAL REPORT.

DIRECTORS:—Messrs. G H Alston, J P Anderson and H J Scott.

ESTATE INSPECTOR:—Mr J P Anderson. ESTATE SUPERINTENDENT:—Mr D I Mackenzie.

ACREAGE:

Tea in full bearing ..	..	374 acres
Jungle and Wasteland	..	199 do
Total	..	573 acres

The Directors submit herewith to the shareholders the report and accounts of the Company for the past year. The crop amounted to 180,125 lb of tea, which is nearly 20,000 lb. short of the estimate, but shows an excess over 1901 of 13,825 lb. The shortfall in 1902 is wholly attributable to the continual rain and absence of sunshine during the last 3 months of the year. The average nett price re-

alised was 27·61 cents per lb.; against a cost of production of 23 08 cents per lb. This included the sum of R3,257·16 spent on manuring, or say 1·81 cents per lb. of made tea, and R1,840·16 spent on re-roofing 2 sets of lines with iron, and other repairs to lines, equal to 1·02 cents per lb. of made tea. The Directors regret to state that between 22nd November and 18th December, on which latter date the theft was discovered, 5,044 lb. tea were stolen from the Factory. Every effort is being made to trace the thieves, but up to date without success. It is however anticipated that a considerable proportion of the value, R1,421·40, will be recovered, but in the meantime the Directors have decided to set aside this amount to a doubtful debts account. After making this provision the nett profit for the year amounts to R4,205 82, to which has to be added R2,603·51 brought forward from 1901, making a total of B6,809·33 available for distribution. The Directors now recommed the payment of a dividend of 2 per cent for the past year and that the balance of R1,509·33 be carried forward to the present years' accounts. The crop for the current season is estimated at 200,000 lb. Tea costing 23·25 cents per lb. delivered in Colombo. Owing to the demand for Green Teas, the Directors have considered it advisable to undertake their manufacture. The necessary machinery is now on the estate and it is hoped that the manufacture of Green Tea will be commenced in the course of the next few days. The additional expenditure for this work should not amount to more than R500, which is included in the expenditure of 23·25 cents. per lb. given above. It is also proposed to continue the planting of para rubber on suitable ground. During the year the Hon. Mr W H Figg resigned his seat on the Board, and the remaining Directors appointed Mr G H Alston to fill the vacancy; in accordance with the articles of Association he now retires, but is eligible for re-election. The appointment of an Auditor for the present year rests with the meeting.—By order of the Directors,

WHITTALL & Co., Agents and Secretaries.
Colombo 5th Feb. 1903.

THE KANDYAN HILLS CO., LTD.

ANNUAL REPORT.

Tea in full bearing	..	410 acres
Not in bearing under two years	..	23 do
Reserve and Forest Lands	..	787 do
Cocoa	..	90 do
Total	..	1,310 do

The Directors beg to present their report for the season ended 31st December, 1902, together with a duly audited statement of accounts for the same period. The Tea Crop including Tea made for others amounted to 206,788 lb., and the Cocoa crop reached cwt 141-1-14, whilst the made Tea gathered from the Estate itself was 182,091 lb as against the estimate of 200,000 lb. The total cost of production, including the expenditure of cents 1·42 on manure, was 25·02 cents per pound of made Tea. After paying interest and all other fees and charges their remains a balance of R2 932·48 at credit of Profit and Loss Account, which the Directors recommend should be carried forward. The new Season's estimate of expenditure amounts to R45,036, or equal to 22·51 cents per pound of made Tea on a crop of 200,000 lb, and includes a sum of R1,960 to be spent on manuring or cts 98 per pound. The Cocoa Crop is estimated at cwt 130 against an expenditure of R3,910. In addition to the above, it has been decided by the Visiting Agent and Directors. that a sum of not more than R2,000 should be spent on Castilloa and Para Rubber to be planted partly in a new clearing, which will be opened for the purpose and partly in ravines and other suitable places on the Estate. At the end of September last the Factory on Pansalatenne was totally destroyed by fire, which necessitated arrangements having to be made for the manufacture of the Green Leaf from the Estate in the neigbouring Factories. Whilst the actual loss to the Company was fully covered by insurance, additional expenditure was incurred for manufacture, and the Superintendent was obliged to resort to finer plucking so as not to exceed the capacity of the Factories, to whom he was indebted for the manufacture of his Teas. The shortage in crop as compared with the estimate is thus partly accounted for, as also the increased cost of production, though the deficiency in crop may be attributed mainly to the abnormally wet season experienced during the latter part of the year. The new Factory has now been completed and is thoroughly up-to-date in its equipment, including Fans and the latest improvements. It will be noticed that in the Profit and Loss Account no special provision has been made for depreciation of buildings and machinery, as the Factory has recently been re-erected, but this has been amply provided for by the surplus remaining over from the amount received as insurance against Loss of Income after covering the cost of rebuilding the Factory. Given a normal season the estimated crop should be realized, and is hoped a better class of Tea manufactured with the ample accommodation and machinery now at the disposal of the Superintendent. In terms of the Memorandum and Articles of Association the Hon. Mr J N Campbell retires from the Board of Directors, but is eligible for re-election. It will also be necessary to appoint a Director in place of Mr W Shakepeare who is shortly leaving the Island. The appointment of an Auditor for the current year rests with the Meeting.

MAHA UVA ESTATE COMPANY, LTD.

ANNUAL REPORT.

DIRECTORS:—Messrs. S Bois, Jas. Polson and G H Alston.

ESTATE INSPECTOR:—Mr. Jas. Polson, ESTATE SUPERINTENDENT:—Mr C W Maclean.

ACREAGE:

Tea in full bearing ..	..	618 acres
Cardamoms ..	..	89 do
Fuel ..	..	20 do
Total Cultivated	..	727 do
Jungle and Waste land, &c.	..	231 do
Total of Estate	...	958 acres

The Directors have now to present to the shareholders the accounts for the past year. The tea crop secured amounted to 242.376 lb. against an estimate of 262,000 lb. the shortfall being due, as in almost all districts, to continued rain and absence of sunshine during the last three months of the year. The cardamom crop however exceeded expectations and yielded about 9,600 lb. against an estimate of 9,000 lb. The prices realised for these products were 34·57 cents per lb. nett for the tea, and 83·33 cents nett per lb. for the cardamoms sold; against 34·78 cents per lb. and 1·25 per lb. respectively in 1901. As shareholders are probably aware, the market for cardamoms has been very low during the last twelve months. After allowing for depreciation on buildings and machinery, and estimating at a low rate for the Cardamoms yet to be sold, the amount at credit of profit and loss account for the year's working was R23,042·31, equal to 7·68 per cent on the paid up capital of the Company, to which has to be added the balance of R3,012·17 brought forward from 1901, and R432·47, being under estimated value of cardamoms appearing as unsold in last year's accounts, making a total of R26,486·95 available for distribution. An Interim dividend of 3 per cent was paid on 5th August last, absorbing R9,000, and the Directors now recommend the payment of a final dividend of 5 per cent, making 8 per cent for the year, and that the balance of R2,486·95

be carried forward to the current year's accounts. The estimates for the present season are 287,000 lb. Tea, including 25,000 lb. tea to be manufactured for others, and 10,000 lb. cardamoms, on an expenditure of R72,906·53, in addition to which a sum of R6,600, has been estimated for new Turbine Piping. In accordance with the articles of Association Mr S Bois now retires from the office of Director but is eligible for re-election. The appointment of an Auditor for the current year rests with the meeting.—By order of the Directors,

Whittall & Co., Agents and Secretaries.

Colombo, 4thFeb., 1903.

PASSARA PLANTERS' ASSOCIATION.

THE TENTH ANNUAL REPORT.

Chairman.—Mr J B Cotton; Hon. Secretary.—Mr A V Ryall; Member to D R C and P R C.—W Stewart Taylor.

Committees:—*Passara.*—Messrs. Jas. Duncan, Geo. Kent Deaker, Capt. H Gordon, J J Robinson, W Stewart Taylor, *Madulsima*—Messrs J M Mason and R Webster, *Lunugala*—Messrs J D P Maclean, Channing Esdaile, F Hall and A L Buyers, *Monaragala*—J H Betts and E Liesching.

Thirty Committee:—Capt H Gordon. Kandy Committee:—Chairman, Secretary, G K Deaker and J M Mason. Hospital Visitors, Badulla.—Messrs G K Deaker and J Duncan, *Lunugala*—J D P Maclean and F Hall. Auditor.—Jas. Duncan.

Register.—The number of estates on the Register is 30 (5 less than in 1901, due to amalgamation of estates).

Finance.—The books of the Association are laid on the table for inspection. The amount standing to the credit of the Association (in the Bank of Uva) is R273·43. Last years' accounts were audited by Mr Duncan.

Meetings.—There have been four Committee and four general meetings, which have all been well attended, showing the interest members take in the Association.

Tea Crop.—The estimated tea crop for estates on the Register of this Association for 1903 is 4,032,500 lb. off 8,844 acres in bearing; an average of 455 lb. per acre. This speaks well for the suitability of this part of Uva for tea production. There are still 1,357 acres not in bearing; the last three months of 1902 were very unfavourable for the production and manufacture of tea, owing to the continuous wet and cloudy weather. Your Committee are glad to report a marked improvement in the market, and that the immediate future is bright, as the stock at the end of 1902 was below 1901, and green tea will (if the bonus is continued) relieve the black tea market of 12 to 4,000,000 lb. Your Committee would recommend you to continue to support the cess and they would also urge you to refrain from returning to coarse plucking, which would only land you in the disastrous position (as regards prices) in which you were a short time ago.

Cocoa.—This product has given a fair crop during the year. Your Committee will watch with the deepest interest, the results of the experiments still being made with a hope of checking tho pod and other diseases which caused so much loss yearly.

Rubber.—Some extension of this product has been made during 1902; both Para and castilloa are being planted and on one estate; the oldest Para Rubber tree will be tapped during 1903—the result of which will be watched with the greatest interest by your Committee.

Post and Telegraph.—Your Committee are glad to announce that your efforts to get a Telegraph Station opened at Madulsima are to be crowned with success.

Coach.—The arrival and departure of the coach at Passara has been most erratic and the coach arrangements still have room for improvement.

Water Supply at Mupane.—The well at Mupane has been built after years of agitation, but whether it will be a success or not remains to be seen.

Police Magistrate.—As Government could not see their way (as requested by your Association) to appoint a permanent Police Magistrate for Badulla itself, they consented to have the date published on which the present itinerating Magistrate would be absent from Badulla.

Nursing Association.—Your Committee are sorry to report the proposal to get Agents and Firms in Colombo to allow estates to subscribe towards this worthy institution met with very little success.

Resthouses.—It affords your Committee much satisfaction to report and note the marked improvement in the comfort and cleanliness in the Resthouses generally for which we are indebted to our worthy Government Agent.

Labour.—The supply of this has not been quite sufficient for the requirements of the District, and in consequence the advances have increased to a very alarming extent and the labour is generally restless and unsettled and your Committee view this with not a little uneasiness. Your Committee therefore think that any scheme for recruiting labour in new districts should be strongly supported, for the prospects of a good harvest in our present recruiting districts, and the fact that other countries are also competing against Ceylon in those parts convince your Committee that the Ceylon Planters should no longer rely on the old districts for their labour requirements.

Tramway or Light Railway.—Both the light railways to Kandapola and the Kelani Valley are nearing completion and your Committee hope that His Excellency Sir West Ridgeway will have a survey made (as promised) of a line between Bandarawela, Passara and Badulla before his departure from the Island.

Roads and Bridges.—The bridge over the (Nukkal) river has been completed after hanging fire for two years and it is a great boon during N.-E. heavy rains to the Monaragalla Estates. R6,000 has been granted towards widening and protecting the Madulsima Road and Your Committee hope the officer in charge will not take on the labour required for this work locally. Some of the roads are in fair order, but your Committee think the laying and macadamising of metal is much delayed This should be begun with the first rains in Sept.

His Excellency the Governor.—Your Committee are only echoing the voice of this Association when they say how grateful they were at tho news of our present Governor Sir West Ridgeway's term of office being extended, but they sincerely regret that that term will expire in October. He has always been a friend to the planters (and to Uva especially.)

Passara Rifle Corps.—This was formed in April, but your Committee regret that some members of your districts have not yet joined. They hope, now the range is completed, they will do so. Of the section there were [?] ex-efficient, six efficient, one non-efficient in class-firing which, they think, was very creditable considering they had no range or practice. The adoption of the report was duly moved, seconded and carried.

HIGHER WAGES FOR INDIAN COOLIES IN THE STRAITS.

The Malay Peninsula Sugar Industry Association have nominated Mr Turner, and Mr Boyd of Gula Estate, to represent them at a conference to be held in Singapore to consider a proposed rate of increase in wages for Indian Immigrants. The feeling of the meeting was that, owing to the greatly increased demand for labour throughout the Colony, and the Federated Malay States, a very material increase on the present rate of wages must be faced.—*Singapore Free Press*, Feb. 10.

TO THE PLANTING WORLD.

Seeds & Plants of Commercial Products.

Hevea Brasiliensis.—Orders being booked for the coming crop August-September delivery 1903, booking necessary before the end of April, quantities of 100,000 and over at special low rates. Plants available all the year round, 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900 :—" I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year." Special offer, post free on application.

Castilloa Elastica.—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for October-November delivery 1903, immediate booking necessary; large quantities on special terms; Plants in Wardian cases.

A foreign firm of Planters writes under date 11th October, 1901 :—" We beg to enquire whether you would procure us 100,000 Castilloa seeds, in which month we might expect them, and what would be the average price." Special offer, post free on application.

Manihot Glaziovii.—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter in sending an order for this seed wrote on the 22nd August, 1900 :—"If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castlloa does not thrive."

Ficus Elastica.—Seeds available in May-June; booking necessary before the end of March; also plants.

Mimusops Globosa (Balata) wood of the tree is much sought for buildings, fruits sweet like a plum and eaten, oil from seeds, said to yield as much as 45 lbs. of dry rubber per tree per annum, the milk is drunk and when diluted with water used as cow's milk, grow from-sea-level up to 2,000 feet, orders being booked for seeds and plants, price on application.

Cinnamomum Zeylanicum (Cinnamon superior variety).—New crop of seed in April to June; booking necessary before the end of February, also plants.

Coffee Arabica-Liberian Hybrid.—A highly recommended leaf-disease resisting hardy new variety of Coffee (cross between Arabian and Liberian). New crop March-April; immediate booking necessary.

A foreign Agricultural Department writes dating 9th September, 1901:—" Please accept our order for 175 lbs. of Tea seed and for 2,000 Coffee beans. In regard to Coffee seed I would say that this will be the first importation made by this department, and we will leave the selection of the varieties to be sent to your judgment."

OUR DESCRIPTIVE PRICE LISTS.

The following six Descriptive Price Lists are now being forwarded with Circulars and special offer of Seeds and Plants of Rubber and other Economic Products :—

1. Tropical Seeds and Plants of Commercial Products, enlarged edition for 1902-1903.
2. Seeds and Plants of Shade, Timber, Wind-Belts, Fuel and Ornamental Trees, Trees for Road-sides, Parks, Open Spaces, Pasture Lands, Avenues, Hedges, and for planting among crops (Tea, Coffee, Cacao, Cardamoms, &c.)
3. Seeds and Plants of Tropical Fruit Trees including Mango grafts.
4. Bulbs, Tubers and Yams.
5. Orchids—Ceylon and Indian.
6. Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Roses, Dracinas, Shrubs and Creepers.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in larger quantities.

" SOUTH AFRICA."—The great authority on South African affairs of 25th March, 1899, says :—" An interesting Catalogue reaches us from the East. It is issued by WILLIAM BROTHERS, Tropical Seed Merchants of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to Willam Brothers."

Agents in London :—MESSRS. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon :—E. B. CREASY, Esq.

Agent in British Central Africa :—T. H. LLOYD, Esq., Blantyre.

Telegraphic Address:
WILLIAM, HENARATGODA, CEYLON.
Liber's, A.I. and A.B.C. Codes used.

J. P. WILLIAM & BROTHERS,
Tropical Seed Merchants,
HENARATGODA, CEYLON.

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Correspondence.

To the Editor.

HUNTING IN THE HILLS.

Amherst, Feb. 12.

SIR,—The Hon. Secretary, C.G.P.S., is welcome to call my remarks about Registered Packs and the slaughter committed by them "a blood and thunder paragraph," but why does he not attempt to refute my statements? He goes on to say that since the new law prohibiting shooting at over 4,000 ft. came into force, that is to say in about 3 years, sambur have increased to such an extent that they need "judicious thinning." He admits that he kills hinds on purpose, but defends his action by pointing out that "judicious thinning out" is resorted to on Scotch deer forests. At home there is such a thing as a severe winter and great scarcity of food, and deer forests would soon get overstocked and deer would starve if they were not thinned out; but surely there is no scarcity of food in the hills in Ceylon, so that the Hon. Secretary must consider "judicious thinning out" necessary for some reason not given. Admitting that it were necessary, the merciful plan of thinning out with the rifle, as adopted at home, would surely be better than allowing a large pack of dogs of sorts to kill as many hinds and fawns as they can manage to pull down. I don't think the Hon. Secretary's plan of "judicious thinning out" would commend itself to owners of deer forests at home or to sportsmen in India or elsewhere. From his concluding paragraph, one gathers that the Hon. Secretary prefers to shoot a stag when it is standing to when it is galloping.—Yours, &c.,

NORTH C. DAVIDSON.

DIFFERENT VARIETIES OF PLANTAIN IN THE ISLAND.

Hanwella, Feb. 14.

DEAR SIR,—I shall be glad to know what other useful varieties of plantains are found in the island, beside the following. If any available I should like to have either by purchase or by exchange of plants. I have in possession viz.—1 Kolikuttu, 2 Suwandel, 3 Puwalu, 4 Ratahondrawalu, 5 Embulhondrawalu, (*a*) Sudu Embulhondrawalu, (*b*) Pulli Embul-hondrawalu, 6 Watu Palu, 7 Anawalu, (*a*) Athdath Anawalu alias Supuanawalu, (*b*) Vanduru Anawalu, 8 Hamban Puwalu, 9 Ratu Kotchi, 10 Sudu Kotchi, 11 Marthawalu, 12 Sudu Kannannoru, 13 Kalu Kannannoru, 14 Sura Mondan, 15 Kalu Mondan, 16 Alu Mondan, 17 Bin-hehel, 18 Puspa Kedeli, 19 Navari, 20 Kitela. The first nine varieties are generally used as fruits and the rest as vegetable.

I learn that the Superintendent of Government School Gardens has a new variety from Queensland called the "Cavendish," but how far it will prove successful in our soil is yet to be seen.—I am, yours faithfully, G. E. AMARASEKARA.

DR. WILLEY'S LECTURE AND PECULIAR CEYLON FISH.

Havelock Town, Feb. 19.

DEAR SIR,—In reply to the enquiry in your issue of Monday last:—

The fish called *Amphisile* referred to by your correspondent is certainly not the fish referred to by Ælian. It can only move by swimming in the middle stratum of water, feeds on microscopic organisms and has a minute mouth, the gape of which is reduced to zero. On the face of it and relying solely upon Sir E Tennent's quotation I should have said that the fish described by Ælian was *Periophthalmus*, a goggle-eyed-fish which crawls and hops about the mangrove flats and also, in some places, on the rocks near the seashore. This fish, which has attained a certain celebrity in books of travel, appears to have been left out of consideration by Sir E Tennent.—Yours faithfully,

ARTHUR WILLEY.

PLANTING NOTES.

DESTRUCTION OF THE OLIVE TREES.—The olive trees which in hundreds of thousands have flourished along the Riviera from times unrecorded, are slowly but surely diminishing in number year by year; and many among the older members of the numerous English colonies sincerely deplore their loss, and the consequent disfigurement of familiar hills and valley. In some places they are being cut down wholesale, and large areas of land on the hillsides have been denuded of all their beautiful trees to make room for the cultivation of more remunerative crops, such as carnations, roses or violets; while, alas, the gnarled and revered old olives, numbers of which have been twisted and torn into the most fantastic shapes by the storms and vicissitudes of actually unknown centuries, are rooted up and hacked to pieces to burn in your hotel bedroom at "two francs fifty" a basket! And why must the inevitable destruction go on? because petroleum is a cheaper lubricant than olive oil; and cotton-seed oil, they say, has falsely assumed the name of olive oil, and taken its place in our salads. —*Travel* for February.

A GOOD YIELD OF RUBBER.—Mr Francis Pears, writing from Muar, gives the following information, which is very welcome:—" In case you have not received previous information, I append particulars of the yield of two cultivated Para trees at Gapis Estate, in Perak, reputed to be 25 years old. The tapping was conducted by Mr Baxendale, and extended over two months, and was done evidently with the intention of procuring a maximum yield.

	Tree No. 1.	Tree No. 2.
Girth at one yard from the ground	89 in.	56 in.
	lb. oz.	lb. oz.
Yield of clean rubber, dry	15 12	11 2
Yield of scrap rubber, dry	2 4	1 8
Total ..	18 0	12 10

Tree No. 1 had never been previously tapped, and was worked from three channels, whereas tree No. 2 was worked from two channels only, and was tapped during 1901 and yielded 3 lb."—*India-Rubber Journal*, Feb. 2.

"SOIL BACTERIA AND BASIC SLAG."

INTERNATIONAL COMPETITION : CLOSING IN THREE YEARS.

In order to encourage investigations into the increase of fertility in soils by the action of bacteria and other micro-organisms, under the influence of mineral manures, with special reference to manuring with basic slag, Verein der Thomasphosphatfabriken (Association of Thomas's Phosphate Works) has instituted a competition with prizes amounting to a total of 40,000 marks (£1,950). Scientific essays and experiments conducted by practical farmers will be admissible in the competition. The method of treatment of the subject is left to the discretion of each competitor. The competition is to be open to all, without regard to nationality. The following five gentlemen have consented to act as judges, any of whom will be pleased to give particular information to intending competitors:—Government Adviser Dr L Hiltner, Principal of the Royal Agricultural and Bacteriological Institution, Munich; Professor Dr Alfred Koch, Principal of the Royal Agricultural and Bacteriological institution, the University, Göttingen; Professor Dr Remy, Principal of the Institute for Researches and Bacteriology, the Royal Agricultural University, Berlin; Professor Dr A Stutzer, Principal of the Royal Agricultural Chemical Institute, the University, Königsber; and Professor Dr H Wilfarth, Principal of the Ducal Agricultural Experimental Station, Bernburg. Competitors are requested to send in their essays written in German to the association not later than February 1st, 1906, by registered post, the envelope to bear a motto in addition to the address. The name of the competitor in each case must be enclosed with the essay, but in a separate closed envelope bearing the same motto on the outside. The latter will not be opened until the judges have made their awards. The address of the association is Berlin, S W, Hafenplatz 4.—London *Times*, February 6.

RAINBOW TROUT OVA.

BATCH BY THE "HAMBURG" A FAILURE.

The batch of 20,000 Rainbow Ova, received by the Ceylon Fishing Club from the Wyresdale Hatcheries, and which arrived in Nuwara Eliya on the 10th Feb. after a delayed voyage out in the N.L.S.S. "Hamburg," have proved a failure as not 8,000 ova out of the big consignment have hatched out, whether it is due to its remaining packed a longer period than usual, or whether it is due to the arrangement made by the Wyresdale Hatchery to get the ova to hatch out earlier than on previous years, it is difficult to say. Ova was not obtainable till the end of March in other years, but this year the consignment arrived as early as the first week in February. The failure of the consignment is a matter of serious concern, as two shipments went bad last year. In our issue of the 16th instant we gave details of the date of shipment and the number of days the consignment had been on the voyage out, together with the further delay caused by the "Hamburg" arriving in port late on Saturday, the 7th Feb. It is to be hoped that the consignment of Brown Trout Ova, which arrived here this week also from the same Wyresdale Hatchery, will give better results.—*Nuwara Eliya Cor.*

TEA AND COFFEE IN SIERRA LEONE.

In a report on Exotic Plants of Economic Interest in the Botanic Gardens at Entebbe, Uganda, Mr J Mahon states he has a number of seedlings of Sierra Leone highland coffee (*coffea stenophylla*) raised from Singapore seed. Tea grows with but moderate rapidity just here. Our rainfall is not great enough. When we have a period of rains it flushes nicely. If its cultivation were carried on here even on a moderate scale to meet some of the local demands it would be necessary to call in the aid of irrigation. Mr Scott Elliot, the naturalist and traveller, seemed satisfied from his explorations in the Ruwenzori country that large areas there offered a fine field for cultivating tea on a large scale.—*London and China Express*, Jan. 30.

A NEW RUBBER VINE.

The U.S. Consul at Tegucigalpa (Honduras) has received information of the discovery in the Pijo Mountains of a vine growing in an uncultivated state which is said to produce rubber of excellent quality. The vines grow to 100 ft in length, varying in diameter from 4 in to 2 ft and they are said to belong to the African family of rubber vines. In Honduras no one seems to know the name of the vine or the botanical family to which it belongs. The discoverer (Senor Davadi, Governor of the Department of Comyagua) regards it as superior in quality to the Para rubber of commerce, and asserts that his convictions are borne out by the analyses made by American and European chemists. The vine thrives at great altitudes as well as in the lower valley levels. Such luxuriance of growth has this plant attained that it is quite capable of being cut in commercial quantities. It may be quickly propagated in the rich soil of the department by means of seedlings, and the growth being so much faster than that of rubber trees, Senor Davadi thinks the quantity of gum obtained would be large. The trees require six years' attention before sapping can begin.—*India Rubber Trades' Journal*, Jan. 19.

WHAT DOES THE WORD "PLANTER" MEAN?

(*To the Editor, Indian Planters' Gazette.*)

Sir,—Will you kindly inform me about the following:—The word *planter* is frequently used both in your own paper and in the daily papers, in a very ambiguous way, and I would like to have the matter explained. Does the word *planter* refer to the *manager*, the *shareholder* or the *proprietor* of an estate? In short does it refer to the manager or to the owners of the estate. For instance, in your leader in Saturday's *Gazette*, "The planter's kith and kin at home are full of sympathy for him," this cannot exactly refer to the *manager* of an estate, for he gets his pay whether the concern is paying a profit or not. The same sort of reference occurs in Messrs. Brooke Bond's letter; does "*lack of enterprise* refer to the *managers*, or to the *shareholders* of the estates?

MANAGING PROPRIETOR.

Jaipalguri, 3rd Feb. 1903.

[A tea planter is a man actively engaged in the cultivation and manufacture of tea. He may be a

Managing Proprietor, or a Shareholder in one or more concerns: he may be a Manager or an Assistant. It matters not what his exact position is so long as he is actively employed in growing and producing tea. Because a planter draws a salary is no reason why his kith and kin at Home should not be full of sympathy for him. His bread and butter depends on the welfare of tea. If tea goes to the wall so will he. The word, however, is often used in much too wide a sense, leading to the ambiguity complained of. A planter is a producer, but a *producer* may not be a planter, but only an absent proprietor or shareholder. The terms are frequently used very indiscriminately, and planters are often wrongly blamed.—ED., *I.P.G.*]
—*Indian Planters' Gazette*, Feb. 21.

MANURING FRUIT TREES.

The season of the year is drawing on when the man with an orchard transfers the manure from his stables to the roots of his trees, or rather the ground above them. His motive is good, but his method often defeats the end he has in view. Who has not, in rambling through country districts in winter and spring seen a pile of manure heaped at the foot of the trees in the orchards? Yes, heaped as though for all the world the trunk was being protected against frost. The veriest tyro should know, and frequently does know, but is too thoughtless to act upon the knowledge that the feeding roots of the tree are far from the trunk. Why, then, manure near the stem? Spread the dung out as far as, or even a trifle farther than, the extent of the branches, and do not put any within 1 yard of the tree trunk.—*From Cassell's "Gardener" for February.*

CULTIVATION OF YAMS AND JERUSALEM ARTICHOKES.

In a recent issue of your *Journal*, a writer urges the introduction of yams in order to make up for the partial failure of the potato crop in 1902. I feel that it would be folly to attempt such action. In the first place the yam is a tropical species, and would probably only succeed in exceptionally warm seasons, and be then only a fancy dish for the wealthy. It is true there is a hardy variety, which was introduced from China or Japan about fifty years back, *Dioscorea batatas*, and I well remember planting the same. It was shaped like a club, about twenty inches long, and four to five inches in circumference at the thickest part tapering at the top to finger size. This was cut into eight pieces, and planted in April; soon after, a shoot appeared above the ground, like the British *Bryony*, and developed every beautiful marbled heart-shaped foliage, like the Sarsaparilla (six feet to seven feet long). When this foliage was killed by frost, I proceeded to sample the crop, very carefully working around the bottle-like neck, and a heavy job it proved, for the tubers ran down about three feet into the rock, and were so brittle that several snapped like a carrot and some yards of soil had to be moved to get out about eight sets. When cooked they proved to be less tasty than a bad waxy potato. It is evident from these facts that *Dioscorea* was useless as a commercial crop, and of doubtful use even after the cook had expended her butter and condiments upon it; either boiled or fried in slices and browned, it was nauseous. I have not tasted other yams than in the tropics, or come across South American sorts cooked in England, but if Asparagus is cynically called an excuse for wasting good butter, the *Dioscorea* deserves greater condemnation. No doubt my Indian cook could make any root palatable, but an reason in writing, is it to say that as we already have a substitute for potatoes available for the poorest, and not by any means despised by the richest, why waste time, labour, land and cooking, on a useless tuber. I refer to the Jerusalem artichoke (*Helianthus tuberosus*). In this neglected vegetable we have a tuber that will grow in any soil, requires no attention when once planted; any odd corner is good enough for it, no frost injures it in the soil, and it is most prolific. The small tubers being set in rows, two feet apart, will give good results; and naturally where well-manured light soil is given (as for early potatoes), the tubers are larger and less rugged in outline. In cooking it, the outer skin should be taken off—if with a silver knife, the tubers do not turn black—and they are cooked till soft; served with white sauce, they possess a nutty sweet flavour, and go well with any roast meat, or preferably, they are worth a course to themselves, while in a white soup they are delicious and very digestible. I find them always appreciated.

GEORGE BUNYARD,
Chairman of the Friut and Vegetable Committee of the Royal Horticultural Society.
—*Journal of the Society of Arts* Jan. 23.

PEARL-FISHERY IN THE RED SEA.

In the latest report issued by the Foreign Office on the trade of Jeddah and Hodeida for the years 1899-1901, Mr. Consul Devey states that there are about 240 sailing vessels registered by the Jeddah harbour department, and only one or two new vessels are built every year. As to those engaged regularly in pearl fishing, there are now only six at Jeddah, 12 at Leeth, nine at Towel, and about 50 of the Jeheinah tribe near Yambo. The pearl-shell fishery has ever been one of the chief industries in these waters, and it must be understood that on this coast the most abundant grounds affording the better qualities are to be found from Bab-el-Mandeb to a point north of—the Farsan Islands, and going north the shell occurs less frequently, till some way above Yambo it ceases entirely. Nothing has ever been done to foster, develop, or to replenish this fishery as it becomes exhausted by the total depletion of the shallower or more easily reached beds; fishers must go farther and divers dive deeper. More valuable shells are found at a depth of from 16 to 25 feet than at from 12 to 20 feet. Divers rarely venture in the Red Sea to a greater depth than 30 feet unless for some very special purpose and reward, or it may be for what is known as black coral. Unquestionably the west side of the Red Sea is richer and more productive than the east in shells.—*Egyptian Gazette*, Feb 10.

CEYLON CROWS: TOWN BIRDS!

Some time ago we mentioned the plan inaugurated in Selangor, and commanded by the President of the United Planters' Association, for importing crows from Ceylon and letting them loose among the plantations to there destroy the coffee bugs. Mr. J C Pasqual now writes to the *Malay Mail* protesting against the importation of such crows. He declares that the Ceylon birds, being the inhabitants of towns, are unsuitable for plantation life, and will congregate around the abodes of men until they become a crying nuisance.—*Straits Times*, Feb. 18.

Monthly Shipments of Ceylon Black Tea to all Ports in 1902-1903.

(Compiled from Chamber of Commerce Circular.)

	UNITED KINGDOM.		RUSSIA.		CONTINENT OF EUROPE.		AUSTRALIA.	
	1902. lb.	1903. lb.	1902. lb.	1903. lb.	1902. lb.	1903. lb.	1902. lb.	1903. lb
January ..	9056013	7720436	612958	323101	151984	127883	714247	1738760
February	7455219		919709		121158		1020948	
March ...	8198179		896513		91081		1713916	
April ...	8521388		988698		93198		2081904	
May ..	9638555		238239		80669		2000522	
June ...	12563050		1984976		166479		1828695	
July ..	10724781		1779011		108785		1747960	
August ...	7396614		1065599		208894		1574498	
September	6652202		795315		70262		1857897	
October ..	6559765		360844		79943		1567796	
November	6386229		937757		213619		1033030	
December	9072552		285785		60628		1577381	
TOTAL ..	102,899,489		11,599,953		1,206,140		18,718,794	

	AMERICA.		ALL OTHER PORTS.		TOTAL.	
	1902. lb.	1903. lb.	1902. lb.	1903. lb.	1902. lb.	1903. lb.
January	125795	538166	389215	584321	11050212	11032667
February	115332		385705		10018071	
March	566263		311191		11777143	
April	807390		290137		12782715	
May	242651		436410		12637046	
June	403005		714471		17660676	
July	464858		846036		15671431	
August	461229		678095		11384929	
September	563981		688730		10628487	
October	483085		655827		9707260	
November	282794		547508		9400936	
December	558864		626319		12181529	
Total ...	5,048.137		6,569,644		146194397	

Monthly Shipments of Ceylon Green Tea to all Ports in 1901—1902.

	UNITED KINGDOM.		RUSSIA.		CONTINENT OF EUROPE.		AUSTRALIA.	
	1902. lb.	1903. lb.	1902. lb.	1903. lb.	1902. lb.	1903. lb.	1902 lb.	1903. lb.
January ...	64021	95535	..	...	...	3000	...	...
February	24839	...	4420	...	...	...	...	..
March ...	14800	...	24210	...	...	...	..	...
April ...	13676	...	8000	...	...	...	...	...
May ...	70103	...	..	...	...	...	..	...
June ..	87340	...	74225	...	...	...	...	..
July ...	40574	...	..	...	...	...	...	..
August ...	70900	...	..	...	...	...	...	..
September	50771	...	..	...	...	...	...	..
October ...	68679	...	..	...	...	...	...	...
November	48076	...	..	...	...	...	..	..
December	40423	...	..	...	..	...	..	...
TOTAL ...	644,443		127,115				...	

	AMERICA.		ALL OTHER PORTS.		TOTAL.	
	1902 lb.	1903. lb.	1902. lb.	1903, lb.	1902. b.	1903. lb.
January ...	113332	265348	...	..	177353	363883
February ..	26480	...	515	...	56254	..
March ...	62313	...	100	...	101423	...
April ...	53610	...	9165	...	84451	...
May ..	32676	...	3280	...	106059	...
June ...	84184	...	4500	...	250249	...
July ...	194016	...	...	...	234590	...
August ...	105982	...	1600	...	178482	...
September ...	333704	...	6800	...	391275	...
October ...	281168	...	..	...	349847	...
November ...	156653	...	20080	...	224809	..
December ...	365843	...	2240	...	408506	...
Total ...	1,968,456		48,280		2,796,844	

* It is impossible to get the figures for the last month in time for publication; but see pages 638, 639 for certain information.

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Agra Ouvah Estates Co., Ltd.	500	...	...	..
Ceylon Tea and Coconut Estates	500	..	...	
Castlereagh Tea Co., Ltd.	100	95	...	97½
Ceylon Provincial Estates Co. Ltd.	500	550	...	...
Claremont Estates Co., Ltd.	100	..	...	..
Clunes Tea Co., Ltd.	100	80	...	80
Clyde Estates Co., Ltd.	100	..	57½	50
Doomoo Tea Co., of Ceylon Ltd.	100	...	..	75
Drayton Estate Co., Ltd.	100	...	...	...
Eila Tea Co., of Ceylon, Ltd.	100	...	55	52½
Estates Co of Uva, Ltd.	500	250	300	—
Gangawatte Tea Co., Ltd.	100	..	..	..
Glasgow Estate Co., Ltd.	500	1175	..	...
Great Western Tea Co., Ltd.	500	...	750	...
Hapugahalande Tea Estate Co.	200	...	...	..
High Forests Estates Co., Ltd	500	500	...	...
Do part paid	400	...	400	-
Horrekelley Estates Co Ltd	100	..	100	...
Kalutara Co., Ltd.,	500	..	375	...
Kandyan Hills Co., Ltd	100	..	.	...
Kanapediwatte Ltd.	100	...	75	75
Kelani Tea Garden Co., Ltd.	100	35	...	..
Kirklees Estate Co., Ltd.	100	110	..	..
Knavesmire Estates Co., Ltd.	100	—	65	..
Maha Uva Estates Co., Ltd.	500	..	...	...
Mocha Tea Co., of Ceylon, Ltd.	500	...	..	..
Nahavilla Estate Co., Ltd.	500	...	..	400
Neboda Tea Co., Ltd.	500	—	..	...
Palmerston Tea Co., Ltd.	500	—	400	—
Penrhos Estates Co, Ltd.	100	—	100	..
Pitakanda Tea Company	500	—	—	—
Pine Hill Estate Co., Ltd.	60	—	50	47½
Putupaula Tea Co., Ltd.	100	—	..	—
Ratwatte Cocoa Co., Ltd.	500	—	—	—
Rayigam Tea Co., Ltd.	100	—	55	..
Roeberry Tea Co., Ltd.	100	90	...	...
Ruanwella Tea Co., Ltd	100	...	60	60
St. Heliers Tea Co., Ltd,	500	..	—	—
Talgaswela Tea Co., Ltd.	100	...	37½	37½
Do 7 per cent Prefs.	100	—	80	...
Tonacombe Estate Co., Ltd,	500	—	—	—
Union Estate Co., Ltd.	500	..	...	—
Upper Maskeliya Estates Co., Ltd.	500	...	650	610
Uvakellie Tea Co. of Ceylon, Ltd	100	80	85	...
Vogan Tea Co., Ltd.,	100	...	60 xd.	..
Wanarajah Tea Co., Ltd.	500	820	—	—
Yataderiya Tea Co., Ltd.	100	..	420	410

CEYLON COMMERCIAL COMPANIES

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Adam's Peak Hotel Co., Ltd.	100	..	30	—
Bristol Hotel Co., Ltd.	100	—	80	—
Do 7 per cent Debts.	100	..	—	—
Ceylon Gen. Steam Navigation Co., Ltd	100	..	225	—
Ceylon Ice & Cold Storage Co. Ltd.	100	105	...	—
Ceylon Superæration Ltd.	100	—	--	—
Colombo Apothecaries' Co. Ltd.	100	—	150	...
Colombo Assembly Rooms Co., Ltd.	20	15	.	...
Do prefs.	20	...	..	...
Colombo Fort Land and Building Co., Ltd.	100	..	...	90
Colombo Hotels Company	100	—	295	290
Galle Face Hotel Co., Ltd.	100	187½	195	187½
Kandy Hotels Co., Ltd.	100	—	...	...
Mount Lavinia Hotel Co., Ltd.	500	—	300	..
New Colombo Ice Co., Ltd.	100	60	70	—
Nuwara Eliya Hotels Co., Ltd.	30	25	27½	..
Do 7 per cent prefs.	100	—	—	—
Public Hall Co., Ltd.	20	...	—	...

LONDON COMPANIES

Company	paid. p. sh.	Buyers.	Sellers.	Transactions.
Alliance Tea Co., of Ceylon, Ltd.	10	...		
Anglo-Ceylon General Estates Co	100	—	52–57	—
Associated Estates Co., of Ceylon	10	..	1½–2½	—
Do. 6 per cent prefs	10	—	3–6	..
Ceylon Proprietary Co.	1	—	3–6	—6
Ceylon Tea Plantation Co., Ltd.	10	—	22½–23½	—
Dimbula Valley Co. Ltd	5	—	5–5½	—
Do prefs	5	—	5–6	—
Eastern Produce & Estate Co. Ltd.	5	—	3¼–3¾	—
Ederapolla Tea Co., Ltd	10	—	5–8	—
Imperial Tea Estates Co., Ltd.	10	...	4½..	—
Kelani Valley Tea Asscn., Ltd.	5	—	3–5	—
Kintyre Estates Co., Ltd.	10	..	4–5	—
Lanka Plantations Co., Ltd	10	—	3–4	—
Nahalma Estates Co., Ltd	1	—	nom	..
New Dimbula Co., Ltd.	1	—	2¾–3	..
Nuwara Eliya Tea Estate Co., Ld	10	—	10⅛	
Ouvah Coffee Co., Ltd.	10	—	6½–7½	—
Ragalla Tea Estates Co., Ltd.	10	—	9–11	—
Scottish Ceylon Tea Co., Ltd.	10	—	10–12	—
Spring Valley Tea Co., Ltd.	10	--	2–5	—
Standard Tea Co., Ltd.	6	—	11–12	..
The Shell Transport and Trading Company, Ltd.	1	— ..	2⅞–3⅛	— —
Ukuwella Estates Co., Ltd.	25	—	par	—
Yatiyantota Ceylon Tea Co., Ltd.	10	—	5¾	—
Do. pref. 6 o/o	10	..	9–9¼	—

BY ORDER OF THE COMMITTEE.

Colombo, March 6th, 1903.

* Latest London Prices

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor General*

	1898.	1899	1900	1901	1902	Av. of 33yrs.	1903.
	Inch	Inch.	Inch.	Inch.	Inch	Inch.	Inch.
January ..	2·32	·98	3·72	11·91	1·95	3·46	3·16
February ..	1·93	2·78	0·63	3·55	4·57	2·02	4·95
March ..	4·21	0·88	3·71	5·12	6·85	4·52	000*
April ..	22·81	6·66	15·12	8·71	10·01	11·30	
May ..	5·80	17·73	10·63	6·28	11·89	11·86	
June ..	10·94	9·23	7·83	5·93	9·84	8·32	
July ..	6·15	1·11	6·77	4·52	4·63	4·46	
August ..	0·97	0·62	7·35	0·46	2·78	3·66	
September ..	6·90	1·48	4·00	3·93	8·18	5·04	
October ...	20·60	12·99	9·47	3·91	31·47	14·56	
November ..	17·38	8·58	9·25	19·84	20·10	13·00	
December ..	3·05	4·44	5·20	1·70	6·43	6·56	
Total..	103·11	73·48	83·68	75·86	118·70	88·76	6·49

* From 1st to 4th March nil, that is up to 9-30 a.m. on the 5th March.—ED. *C.O.*

CEYLON TEA: MONTHLY SHIPMENTS TO UNITED KINGDOM AND ESTIMATE.

Estimate for Feb. 1903—7½ to 8 mill. lb.

Total Shipments Do 1903— 7,750,000 lb.

Do Do Do 1902— 7,455,219 lb.

Do Do Do 1901— 8,333,266 lb.

[ESTIMATE for Mar. 1903—8½ to 9 million lb.]

A BIG PINEAPPLE.—Can Ceylon equal what is thus told us by "Modern Mexico":—The "father of pineapples," and one of the largest ever shipped from Mexico, was received by the Laguna Chica Plantation Company, of St. Louis, last month, from its Mexican plantation. It was 18½ inches in length, 20½ inches in circumference at the larger end, and weighed 18 pounds. It is claimed that the fruit is as delicate and delicious as any of the smaller kinds of pineapples.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

EXPORTS

Colombo, Mar. 2nd, 1903.

CARDAMOMS :—
All round parcel, well bleached per lb. R1·00
Do. dull medium do. R0·80
Special assortment, 0 and 1 only do R1·20
Seeds do. R0·70

CINCHONA BARK :—
Per unit of Sulphate of Quinine 7c—1½ to 3 per cent.

CINNAMON :—(in bales of 100 lbs. nett.)
Ordinary assortment per lb. 50c.
Nos. 1 and 2 only per lb. 56c,
Nos. 3 and 4 only per lb. 41½c.

CINNAMON CHIPS :—(in bags, of 56 lbs. nett. per candy of 560 lb.) R60·00

COCOA :—
Finest estate red unpicked per cwt R42·00
Medium do do do R40·00
Bright native unpicked and undried R35·00
Ordinary do do do R30·00

COCONUTS—(husked)
Selected per thousand R51·00
Ordinary „ R42·00
Smalls „ R35·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R80·00
Do in bags none.

COCONUT (Desiccated).
Assorted all grades per lb 17c.

COCONUT OIL—
Dealers' Oil per cwt. R15·00
Coconut Oil in ordinary packages f. o. b. per ton R337·50.—Higher figure paid for April, lower for June delivery.

COFFEE.—
Plantation Estate Parchment on the spot per bus.—R9 50.
Plantation Estate Coffee f. o. b. (ready) per cwt.—None
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb.—58c.

COPRA—
Boat Copra per candy of 560 lb. R49·00
Calpentyn Copra do do R49 00
Cart do do do R44·00
Estate do do do R48·00

CROTON SEED per cwt—R11·00

EBONY—
Sound per ton at Govt. depot None—Next Sale on 30th March.
Inferior None—Next Sale on 30th March.

FIBRES—

Coconut Bristle	No. 1	per cwt	None
Do	„ 2		None
Do mattress	„ 1		None
Do	„ 2		None
Colr Yarn, Kogalla	„ 1 to 8		R16·50
Do Colombo	„ 1 to 8		R12·00
Kitool all sizes			None
Palmyrah			None

PEPPER—Black per lb None

PLUMBAGO—

Large lumps	per ton	R600·00	Firmer.
Ordinary lumps	do	R550·00	
Chips	do	R350·00	
Dust	do	R250·00	
Do (Flying)	do	R125·00	

SAPANWOOD— per ton R45·00—Nominal.

SATINWOOD (Sound) per cubic ft. R5·90—Sales of 26th Jan
Do (Inferior) per cubic ft. R4·40— do
Do (Flowered) per cubic ft. R10·70— do

TEA—	High Grown Average	Medium Average.	Low Grown Average.
Broken Pekoe and Broken	cts	cts	cts
Orange Pekoe per lb	54	51	42
Orange Pekoe do	51	43	37
Pekoe do	48	40	35
Pekoe Souchong do	35	33	33
Pekoe Fannings do	36	32	29
Broken mixed—dust, &c	28	28	27

CEYLON EXPORTS AND DISTRIBUTIO FOR SEASO'S 1902 AND

COUNTRIES	Black Tea. 1903 lbs.	Black Tea. 1902 lbs.	Green Tea 1903 lbs.	Green Tea 1902 lbs.	Coffee—cwts. Plantation	Coffee—cwts. N'tive	Coffee—cwts. Total	Cocoa cwts.	Cardamoms lbs.
To U K.	13318904	14966224	139954	88860	729	..	729	12801	62853
„ Austria	12358	175	...	...	...	..	..	100	...
„ Belgium	20732	8137	...	...	2	..	2	223	...
„ France	65,70	55418	1430	...	...	..	..	161	...
„ Germany	112240	94074	..	...	..	..	..	835	10645
„ Holland	..	750	..	..	...	..	...	...	...
„ Italy	4229	1760	...	..	...	..	...	...	...
„ Russia	323101	1190219	...	..	...	...	...	...	..
„ Spain	300	500	...	..	...	..	...	31	...
„ Sweden	12594	10755	..	...	...	..	...	..	...
„ Turkey	5345	7573	..	...	..	..	...	...	..
„ India	123914	117030	305	...	...	..	...	...	28679
„ Australia	2995035	1735195	...	...	139	20	159	167	...
„ America	1047971	221857	739186	139812	..	...	...	325	...
„ Africa	52219	70189	..	...	...	..	..	..	600
„ China	645061	493808	...	..	3	..	3	..	3166
„ Singapore	28368	20727	...	..	...	..	..	462	1138
„ Mauritius	15482	3160	...	..	..	...	...	-	..
„ Malta	39285	54750	..	..	..	...	..	...	..
Total export from 1st Jan. to 2nd Mar. 1903.	18822508	19052241	883875	228672	873	20	893	15105	107081

COUNTRIES	Cinnamon Bales. lbs.	Cinnamon Chips. lbs.	Coconut Oil 1903 cwts.	Coconut Oil 1902 cwts	Copra cwts.	Dsiccated Coconut lbs.	Poonac. cwts.	Coconuts. No.	Plumbago. 1903 cwts	Plumbago. 1902 cwts.
To U K.	58674	181176	41933	15866	6750	1905863	997	701390	10552	30709
„ Austria	50	43012	5142	1701	4000	8350	...	..	...	...
„ Belgium	5610	22100	1661	...	569	32417	16011	61970	3382	2256
„ France	1000	29400	2098	...	7775	14000	...	..	204	...
„ Germany	76011	78120	616	1333	29714	113730	12141	63920	6861	6863
„ Holland	1000	11200	203	...	...	6500	..	..	..	...
„ Italy	17500	22400	612	607	...	..	..	..	..	...
„ Russia	..	..	...	...	6500	-	..	...	101	...
„ Spain	54300	8400	..	...	...	14900	..	...	...	...
„ Sweden	..	..	211	...	...	3250	...	...	..	...
„ Turkey	..	...	..	...	...	...	..	...	..	..
„ India	100		2833	10785	...	...	...	19100	174	1576
„ Australia	100	2[illegible]00	45	..	...	87027	...	..	220	25
„ America	99949	..	13218	499	...	155418	...	...	38058	17371
„ Africa	...	..	204	...	..	16385	...	224577	..	...
„ China	...	..	201	...	...	..	...	..	..	637
„ Singapore	...	..	..	...	...	..	..	..	..	..
„ Mauritius	...	..	..	...	...	...	...	...	...	...
„ Malta	...	..	..	..	..	...	..	..	..	..
Total export from 1st Jan. to 2nd Mar. 1903.	314285	398908	68975	30791	55308	2358020	29149	1070957	59552	59437

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Price Current, London, 11th February, 1903.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ..	70s a 80s
Zanzibar & Hepatic ,,	Common to good ..	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine .	7d a 8d
BEES' WAX, cwt.		
Zanzibar Yellow ,,	Slightly drossy to fair	£6 10s a £6 15
Bombay ,,	Fair genuine ..	£5 10s a £6 5s
Madagascar ,,	Dark to good palish	£6 7s 6d a £7
CAMPHOR, Formosa ,,	Crude and semi-refined	160s a 175s
Japan ,,	Fair average quality .	170s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	1s 6d a 1s 10d
	Middling, stalky & lean	1s a 1s 2d
Ceylon. Mysore ,,	Fair to fine plump ..	1s a 3s 3d
	Seeds .	1s 2d a 1s 4d
,, Tellicherry ,,	Good to fine ..	1s 6d a 2s
	Brownish .	1s 3d a 1s 6d
,, Long ,,	Shelly to good ..	9d a 2s
,, Mangalore ,,	Med brown to good bold	2s 8d a 2s 11d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	2d a 2¼d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	31s a 40s
CINCHONA BARK.– lb.	Ledgeriana Orig. Stem	6d a 9d
Ceylon	Crown, Renewed	5d a 7d
	Org. Stem	2½d a 6½d
	Red Org. Stem	2½d a 4½d
	Renewed	3d a 5¾d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts	Ordinary to fine quill	8½d a 1s 6d
per lb. 2nds	,, ,,	8d a 1s 6d
3rds	,, ,,	7½d a 1s 4d
4ths	,, ,,	7d a 11d
Chips	,, ,,	2½d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	5½d a 1s
Amboyna ..	Dull to fine	5d a 6d
Zanzibar and Pemba	Good and fine bright	3⅞d a 4d
	Common dull to fair	3½d a 3¾d
Stems ..	Fair	2d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	90s a 115s
	Middling to fine mid ..	70s a 100s
	Smalls	59s a 62s
Native	Good ordinary	40s a 50s
Liberian ,,	Small to bold	30s a 40s
COCOA, Ceylon ,,	Bold to fine bold	65s a 85s
	Medium and fair	58s a 64s
	Native	50s a 57s
COLOMBO ROOT ,,	Middling to good	8s a 14s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair .	£13 10s a £18
FIBRE, Brush ,,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	15s a 25s
CUTCH ,,	Fair to fine dry	25s a 30s
GINGER, Bengal, rough,,	Fair	40s
Calicut, Cut A ,,	Good to fine bold	80s a 85s
B & C ,,	Small and medium	46s a 60s
Cochin Rough ,,	Common to fine bold	34s a 40s
	Small and D's	32s a 34s
Japan ,,	Unsplit	30s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	10s a 35s
ANIMI, Zanzibar ,,	Picked fr. fine pl. in sts.	£10 a £13
	Part yellow and mixed	£7 a £10
	Bean and Pea size ditto	£75 a £9
	Amber and dk. red bold	£5 15s a £7 10s
	Med. & bold glassy sorts	95s a £6 15s
Madagascar,	Fair to good palish ..	£4 a £8
	,, ,, red ..	£4 5s a £7 10s
ARABIC E. I. & Aden ,,	Ordinary to good pale	27s a 37s 6d
Turkey sorts ,,		27s 6d a 32s 6d
Ghatti ,,	Pickings to fine pale ...	12s a 25s
Kurrachee ,,	Good and fine pale ...	27s 6d a 30s
	Reddish to pale selected	10s a 25s
Madras ,,	Dark to fine pale ...	15s a 20s
ASSAFŒTIDA ,,	Clean fr. to gd. almonds	50s a 10 s
	Ord. stony and blocky	9s a 45s
KINO ,,	Fair to fine bright	4d a 5d
MYRRH, picked ,,	Fair to fine pale	75s a 120s
Aden sorts ,,	Middling to good	65s a 95s
OLIBANUM, drop ,,	Good to fine white	42s a 47s 6d
	Middling to fair	28s a 42s
pickings ,,	Low to good pale	18s a 26s
siftings ,,	Slightly foul to fine	18s a 23s
INDIARUBBER, Ceylon	Fine (grwn. fr. Para seed)	2s 8d a 4s 3d
Assam	Good to fine	2s a 3s
	Common to foul & mxd.	7d a 1s 9d
Rangoon	Fair to good clean ...	2s a 3s
Borneo	Common to fine	6d a 2s 6d

	QUALITY.	QUOTATIONS.
INDIARUBBER (Contd.)		
Java, Sing. & Penang lb.	Foul to good clean ...	8d a 3s
Mozambique ,,	Good to fine Ball ...	2s 6d a 3s 2d
	Ordinary to fair Ball ...	2s a 2s 4d
	Low sandy Ball ...	9d a 2s
	Sausage, fair to good ..	3s 2d
	Liver and Livery Ball ..	1s 9d a 2s 8½d
Nyassaland	Fair to fine ball ...	2s 3d a 3s 3d
Madagascar	Fr to fine pinky & white	2s a 2s 6¾d
	Fair to good black ..	1s 1d a 2s 3¾d
	Niggers, low to fine .	7d a 2s
INDIGO, E.I	Bengal--	
	Shipping mid to gd violet	3s 8d a 4s
	Consuming mid. to gd.	3s 2d a 3s 7d
	Ordinary to mid.	2s 8d a 3s 1d
	Mid. to good Kurpah	1s 9d a 2s 3d
	Low to ordinary	1s a 1s 7d
	Mid. to good Madras	1s 4d a 1s 10d
MACE, Bombay & Penang	Pale reddish to fine	3s a 3s 6d
per lb.	Ordinary to fair	2s a 2s 9d
	Pickings	1s 9d a 1s 11d
MYRABOLANS, Madras } cwt	Dark to fine pale UG	5s a 6s nom.
	Fair Coast	4s 3d a 4s 6d
Bombay ,,	Jubblepore	4s a 5s 6d
	Bhimlies	4s a 7s 6d
	Rhajpore, &c.	3s 6d a 5s 6d
Bengal ,,	Calcutta	3s 6d a 5s nom.
NUTMEGS— lb.	64's to 57's	3s
Bombay & Penang ,,	110's to 65's	1s 2d a 2s 9½d
	160's to 115's	6d a 1s 1d
NUTS, ARECA cwt.	Ordinary to fair fresh	14s a 17s
NUX VOMICA, Bombay	Ordinary to middling	5s 6d a 6s
per cwt. Madras	Fair to good bold fresh	7s a 10s
	Small ordinary and fair	5s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	4s 2d a 4s 3d
CASSIA ,,	According to analysis	2s 6d a 3s 6d
LEMONGRASS ,,	Good flavour & colour	5d a 5¼d
NUTMEG ,,	Dingy to white	1¼d a 2½d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 1d
CITRONELLE ,,	Bright & good flavour	9d a 10½d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody..	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf ..	10s a 14s
	,, wiry Mozambique	10s a 11s
PEPPER - (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ..	5⅛d a 6⅛d
Singapore ..	Fair	6d
Acheen & W. C. Penang	Dull to fine	5⅛d a 5⅝d
PLUMBAGO, lump cwt.	Fair to fine bright bold	30s a 35s
	Middling to good small	20s a 28s
chips	Dull to fine bright ..	9s a 15s
dust	Ordinary to fine bright	4s a 7s 6d
SAFFLOWER	Good to fine pinky .	65s a 75s
	Inferior to fair .	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£15 a £30
Chips ,,	... ...	£5 a £8
Madras, Logs ,,	Fair to good flavour ..	£15 a £30
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good ..	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth ...	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	117s 6d a 120s
SENNA, Tinnevelly lb	Good to fine bold green	5½d a 8d
	Fair greenish	3½d a 5½d
	Common dark and small	1¼d a 3d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's	30s a 140s
	D's and B's	
	Small ...	
Mergui ,,	Small to bold ..	£7 15s a £10 10s
Mussel ,,	Small to bold ...	17s a 55s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	8s a 10s
per cwt. Madras	Stony and inferior ..	4s 6d a 6s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	15s a 22s
TURMERIC, Bengal cwt.	Fair ...	14s
Madras ,,	Finger fair to fine bold bright	10s a 14s
Do. ,,	Bulbs ..	9s
Cochin ,,	Finger .	10s a 12s
	Bulbs ...	9s a 9 6d
VANILLOES— lb.		
Mauritius .. 1sts	Gd. crystallized 3½ a 8½ in	7s 6d a 28s 6d
Bourbon ... 2nds	Foxy & reddish 3½ a 8 ,,	6s a 13s
Seychelles 3rds	Lean and inferior ...	5s 6d a 8s 6d
VERMILION lb.	Fine, pure, bright ...	3s a 3s 1d
WAX, Japan, squares cwt	Good white hard ...	53s 6d a 54s 6d

THE
AGRICULTURAL MAGAZINE,
COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for March :—

Vol. XIV.] MARCH, 1903. [No. 9.

INTERESTING PHENOMENA IN PLANT NUTRITION.

WE are told in text-books on Botany that in many cases the root hairs, the ordinary absorptive organs of the plant, are replaced by a fungus whose hyphae absorb nutriment in the same way. Such a fungus is termed a mycorhiza which in some cases as in the cone-bearers is ectotropic, *i.e.*, the hyphae do not enter the cells of the root but run between the epidermal cells, while in others as in orchids it is endotropic, *i.e.*, the hyphae enter the cells of the root. There is further the phenomenon, seen in some trees, where the roots are parasitic upon other roots living in the same soil, and are modified in structure to suit this modification of their absorptive functions.

Both these phenomena are very interesting as suggesting the means by which such trees as are dependent to some degree on other organisms for the supply of their food, may have their environments made suitable to their requirements.

Under the conditions in which they grow, it can be imagined that the want of the mycorhiza in the one case or the absence of the companion tree in the other, would result in growth under great disadvantages. The question is to what extent does Symbiosis exist among plants under cultivation, and to what extent could we control the conditions under which the plants flourish?

In an article on the Sandal-wood tree by Sir Deidrich Brandis, we are told that this tree is so to speak a root-parasite, *i.e.*, it has been ascertained by microscopic examination that its roots attach themselves to the roots of other plants. Sir Deidrich mentions the trees for which the Sandal-wood has a special affinity, and concludes that in order to thrive it is necessary that the tree requires its roots to be in intimate contact with the roots of other plants of different orders and structure and organisation. Indian Foresters would appear to have long known, as the result of experience, that Sandal-wood thrives particularly well in company with Casuarina and Lantana. Sir Deidrich is reasonably convinced that this tree takes up a large proportion of its mineral food through haustoria, or sucking organs, from the roots of the plants upon which it depends.

The following questions would therefore seem to be very pertinent in regard to any cultivated plant.—Is the tree furnished with root hairs for taking up nutriment directly from the soil? To what extent are the typical root hairs replaced by haustoria or sucking organs? If at all dependent on other trees, what are the best companions for the tree in question?

It is an axiom in agriculture to give each plant plenty of room, but this latest theory would appear to show that it is not at all unlikely that there is something to be gained by association of plants with one another, provided the right plants are grown together. Indeed, the striking luxuriance of virgin forest vegetation appears to suggest some such explanation, and even hint at a system of natural selection of companions by trees that have never been brought under the control of man. Planters will tell us that some forest trees, irrespective of the lightness or density of the shade which they afford, (and possibly also independent of the density or lightness of the wood—as to some extent indicating the demand

for mineral food from the soil) have most beneficial effects on their cultivated crop. Indeed, certain hard-wood non-leguminous trees are fancied in preference to others that might be expected to serve better for shade. In spite of the reputed value of *Albizzia Moluccana*, no planter who has any acquaintance with this wonderfully fast-growing tree will advise that it be grown for cocoa-shade, but there are those who stick by such apparently objectionable trees as *Alstonia Scholaris* (Rukattana) relying upon their personal experience of its growth among cocoa. The *Erythrinas* are admitted to be as suitable shade trees for cocoa as could be wished for, but there are old-fashioned growers who still stand by the Jack.

We have heard a deal about the advantages of growing Grevillea among tea, and an explanation from a chemical point of view has apparently given satisfaction; but that there may be more than the relation indicated to account for the peculiar beneficial association of different plants, and that a deeper knowledge of biology will probably reveal greater marvels than we have yet known in the vegetable world, is more than likely.

"The science of agriculture," says Sir Deidrich Brandis, in concluding his article, "was many centuries old before the efficacy of the rotation of crops was comprehended. Can it be that we are now to hear of a discovery that will revolutionise the present methods of culture in field and garden?" It remains to be seen.

OCCASIONAL NOTES.

In the last issue of the *Asiatic Quarterly*, Major Phipson makes a forcible plea for the attention of Government to the problems of rural economy, and enunciates the following principle in support of that plea, namely, It is not enough for Government to maintain peace and security and suppress crime throughout its jurisdiction, since the very fact of its discharging these functions tends to bring about a more or less rapid increase in population; and such increase, if it is not to become a source of danger and disintegration to the State and misery to the people themselves, demands from it the efficient discharge of its economic functions. He holds that the more efficient a Government becomes in the discharge of any one special function, the more pressing the need for efficiency in others, and that better a falling short in all departments than success in one or two. These views, as the *Indian Agriculturist* puts it, are more academic than practical, but, all the same, Major Phipson's arguments have their application.

Mr. G. E. Amarasekara, Planter, of Hanwela, writes to the *Ceylon Observer* of February 23rd:—"I shall be glad to know what other useful varieties of plantains are found in the island, beside the following. If available I should like to secure them either by purchase or by exchange with the following plants I have in possession, viz.—1 Kolikuttu, 2 Suwandel, 3 Puwalu, 4 Ratahondrawalu, 5 Embulhondrawalu, (*a*) Sudu Embulhondrawalu, (*b*) Pulli Embulhondrawalu, 6 Watu Palu, 7 Anawalu, (*a*) Athdath Anawalu *alias* Supuanawalu, (*b*) Vanduru Anawalu, 8 Hamban Puwalu, 9 Ratu Kotchi, 10 Sudu Kotchi, 11 Marthawalu, 12 Sudu Kannannoru, 13 Kalu Kannannoru, 14 Sura Mondan, 15 Kalu Mondan, 16 Alu Mondan, 17 Bin-kehel, 18 Puspa Kedeli, 19 Navari, 20 Kitela. The first nine varieties are generally used as fruits and the rest as vegetable. I learn that the Superintendent of Government School Gardens has a new variety from Queensland called the "Cavendish," but how far it will prove successful in our soil is yet to be seen."—In addition to the "Cavendish," plants of the following varieties have been imported from Queensland for the Government Stock Garden, where they are doing well, but have not fruited yet: Ladies' finger, Sugar, Moka, Borego, Delena, Dacca and Butter.

The first distribution of silkworm eggs to School Gardens has unfortunately not proved successful. A stray egg was hatched here and there, but the worms have not come to anything. The reason for this is that the *ova* did not undergo the necessary refrigeration. Part of the original supply which had been put in cold storage hatched out at Peradeniya and passed through the usual metamorphoses. The supply of eggs secured from these moths will be refrigerated before distribution to schools, so that better results may now be looked forward to. In the meanwhile the mulberry cuttings that have been planted out in School Gardens will have time to develope.

On February 21st the improved box hive kept at the Government Stock Garden was successfully manipulated by the Superintendent of School Gardens, with the help of Mr. H. F. Fernando of the Colombo Museum, a few frames of comb honey were removed, and the hive cleaned out and re-set. The honey, in the opinion of all those who tasted it, was of excellent quality.

We have to thank Prof. Datta, of Sibpur, for a parcel of seeds, consisting of the following varieties:—Soy Bean, Onion, Beta Benghalensis, Buri Cotton (Gossypium herbaceum), Jute (Corchorus capsularis) and tubers of African yams. We have in return, sent at the request of Mr. Datta, the following seeds—Ipomœa Muricata, Amaranthus Gungeticus and other varieties Spinach (2 varieties), Luffa (2 varieties), Capsicum (mixed), Ladies' Fingers, Long Runner Bean, Egg Plant, and a few additional varieties in stock.

We have also to thank the Director-General of Agriculture for India for sending us a package of three varieties of American sweet potatoes that have been found suitable for cultivation in India. The potatoes reached us in fair order, considering the long journey by rail and boat from Nagpur, and many of them were found to have sprouted. The three varieties are named "Virginia," "New Jersey," and "Nancimund." We shall have more to say about them in our next issue.

The seeds of *Dendrocalamus strictu* (the male bamboo) widely distributed from the Royal Botanic Gardens were probably not as fresh as they might have been, and many persons failed to grow them. We are glad to say that a fair number of plants have come up in the Government Stock Garden, and that a few can be spared. According to the Botanic Gardens Circular, the bamboos are useful for rafters, battens, spear shafts, fencing, mamoty-handles, &c.

We are obliged to the Hull Oil Manufacturing Co., Ltd., for a sample of Homco Castor meal containing 10—12 % ammonia guaranteed. The manure besides contains phosphoric acid equal to about 7 % tribasic phosphate of lime, and potash equal to about 3 % sulphate of potash. It is believed that this meal is the most highly concentrated vegetable source of ammonia at present on the market. The quotation for this excellent fertiliser is 12 shillings 9 pence per unit of ammonia per ton, in double bags, c.i.f. Ceylon, but in order to introduce the meal the manufacturers are inclined to take a little less for a trial parcel. The following is Mr. John Hughes' analysis :—

1.	Nitrogenous organic matter	77·64
	Water (lost at 212° F.) ...	10·24
	Oil	2·43
2.	Mineral matter (ash) ...	9·69
		100·00
1.	Containing Nitrogen ...	8·74
	Equal to Ammonia ...	10·61
2.	Containing phosphoric acid...	3 20
	Equal to phosphate of lime	6·98
	Potash	1·59
	Equal to sulphate of potash	2·94
	Lime	·82
	Magnesia	1·24
	Soda	·73
	Insoluble matters &c. ...	2·11

We have to acknowledge receipt of the following leaflets and pamphlets from the Department of Agriculture, Cape of Good Hope:—Poultry, Tobacco Culture, Artificial Grasses and Fodder for Stock, Methods of Locust Destruction, Insect Pests, Methods of Preserving Fish by Smoking, the Velvet Bean, Elementary Principles of Silviculture, Treatment of Worms in Domestic Animals, Poultry Raising, Fowl Ticks, South African Poultry Keeping, Trout Breeding and Stocking of Streams, The Ocean and its Resources, Ants, Diseases of Stock and their Treatment, and Fruit Culture.

From India we have received the following numbers of the Agricultural Ledger series: Composition of Indian Cows' and Buffaloes' Milk, Adhatoda Vasica, Management of Dairy Cattle in India, Dendrocalamus Strictus, Paspalum Dilatatum, Dairy Farming and Dairy Produce, The Indian Aconites, and a pamphlet on the cultivation of Sweet Potatoes in India by Mr. James Mollison.

The exchanges received during the month are: The Agricultural Gazette of New South Wales; The Agricultural Journal, Cape of Good Hope; The Journal of the Department of Agriculture, Victoria; The Station, Farm and Dairy; and Australian Products Journal, Sydney; The Queensland Agricultural Gazette; The Veterinary Journal, Edinburgh.

The Sugar Beet and Swiss Chard so highly recommended by the Himalaya Seed Stores are being grown experimentally in the Government Stock Garden.

METEOROLOGICAL OBSERVATIONS TAKEN AT THE COLOMBO STOCK GARDEN DURING THE MONTHS OF JANUARY AND FEBRUARY, 1903.

January.				February.			
1	Nil	17	Nil	1	Nil	15	Nil
2	Nil	18	Nil	2	Nil	16	
3	·39	19	Nil	3	Nil	17	Nil
4	1·27	20	Nil	4	Nil	18	Nil
5	1·54	21	Nil	5	Nil	19	Nil
6	Nil	22	Nil	6	Nil	20	Nil
7	·60	23	Nil	7	Nil	21	Nil
8	Nil	24	Nil	8	Nil	22	Nil
9	Nil	25	Nil	9	Nil	23	Nil
10	·15	26	Nil	10	Nil	24	·75
11	Nil	27	Nil	11	·16	25	·81
12	Nil	28	1·60	12	·35	26	·80
13	Nil	29	·13	13	Nil	2	Nil
14	Nil	30	Nil	14	Nil	28	Nil
15	Nil	31	Nil				
16	Nil	1	Nil				
		Total...	5·68			Total...	2·87
		Mean...	·18			Mean...	·10

Greatest amount of rainfall in any 24 hours, on the 28th January, 1·60 inches.

Greatest amount of rainfall in any 24 hours, on the 26th February, ·81 inches.

Recorded by ALEX PERERA.

AGRICULTURAL EDUCATION IN THE EAST.

The appearance of another text-book on Indian Agriculture draws attention to the subject of agricultural education in the East. The author, Prof. N. C. Mukerji, is well qualified to write on the subject, having himself been a distinguished student of Cirencester, where he passed with the highest honours, and spent many years in the study of Indian agricultural problems. After considering all the obstacles that stand in the way of agricultural improvement in the East, and the means of removing such obstacles, the author makes the statement that he looks to education in agriculture for the greatest benefit. But unfortunately, as he puts it, "neither the farm labourer, nor the farmer, nor the landed proprietor cares, as a rule, for agricultural education. Agricultural schools in almost every country are crammed either with place-seekers or town-bred men who fancy they can make their fortune by scientific farming." Mr. Mukerji advocates inducing—by the offer of scholarships or otherwise—sons of *bona fide* culti-

vators, who have passed the middle vernacular and normal school examinations, to come for special agricultural training to a central institution and then go back to their respective villages.

In the case of the late Colombo School of Agriculture the prospect of employment under Government—such as is held out to students of the Technical College—was absent, nor were such scholarships available as Mr. Mukerji suggests and are now given to the students being trained as English teachers for the benefit of private schools.

We are, however, doing the next best thing, now that we have no School of Agriculture, and that is, carrying the agricultural propaganda into the heart of the country and working through the best available medium, namely, the village school boy.

To those who say there is no encouragement for the people to grow fruits and other edible products, on the ground that such cultivation has been tried by planters without success, we would quote Mr. Mukerji to the effect that it will not pay the "gentleman," not only because his standard of living is a bar to such success, but also for another reason—"It is by dint of hard labour and frugality that the Indian (and we may add Ceylon) cultivator makes agriculture pay. If a gentleman were to employ labourers and go in for ordinary farming, he will find these labourers (so industrious when working for themselves) sleeping over *his* work and accomplishing very little when pretending to do work actually in his presence."

This is undoubtedly the true explanation of why Paddy cultivation can not be made to pay the "Gentleman Farmer" at the present market price of grain, and the cultivation of oranges and lemons will only pay the native grower.

SILKWORMS AND SILK.

The following is the text of the Government Entomologist's Nature Study lesson on Silkworms, issued in connection with the attempts that are being made to introduce sericulture as a village industry :—

You probably all know what silk is. You must have seen pieces of silk cloth. But I wonder if you know where the silk comes from, and how it is made? Silk is produced by a particular kind of caterpillar that feeds upon mulberry leaves. I will try to describe to you how the caterpillar lives and makes the silk, and how the silk is afterwards spun to be woven into cloth. Later on I will send you some eggs of the silkworm, so that you can rear them up and watch them at work.

We will suppose that you have some of these eggs. They are small round gray little things, flattened on the top, and about the size of the head of a pin. They look very like the seeds of some plant. You must keep them in a cardboard box and look at them carefully every morning. Some day—sooner or later—you will find a number of tiny dark brown caterpillars wandering about the box; and a corresponding number of the eggs will be empty, each having a small round hole at one side, through which the little grub has made its escape. They will be hungry; so you must run away at once and bring in some mulberry leaves. Choose the young and tender leaves from the ends of the branches, as the baby caterpillars cannot bite through the older leaves. You should lay the leaves on a paper tray, and with a small feather you can pick up the little caterpillars and place them on their food. They will stay there quite happily as long as the leaves remain fresh, and will gnaw little holes all over them.

You must be careful to keep the tray in some place where the ants cannot get at the silkworms. You might put it on a table the legs of which are standing in pots of water. The worms will want fresh leaves every morning and every evening, and perhaps in the middle of the day too. If you do not give them enough fresh food, they will become restless and wander away in search of a meal. When you put the fresh leaves in the tray, lay them gently on the top of the old ones. You need not touch the little caterpillars; they will walk on to the new leaves by themselves. Later on, you can take away the old leaves.

You will have noticed that when they first came out of the egg the little caterpillars were of a dark colour and had a rough hairy skin. As they begin to grow, they become paler in colour, and the skin loses most of its wrinkles. But a time comes when the skin, which can stretch only to a certain extent, becomes unpleasantly tight. The silkworm has outgrown its first coat, and must change it for a larger one. How do you think that it manages this? Well, when the skin gets too tight, it suddenly splits along the back, at a point just behind the head, and the caterpillar walks out of its old skin, with a new and larger coat already on its back. Not only has it changed its outside skin, but has at the same time changed the lining of all its internal parts,—its stomach and its breathing tubes. The growing caterpillar provides itself with a new coat, in this manner, four times during its life. For a short time before each change, it becomes sluggish and stops feeding. It should not be disturbed at such times.

When full grown, the caterpillar measures from $2\frac{1}{2}$ to 3 inches in length, and is as thick as a rather stout pencil. It is of a grayish white colour, sometimes with a few blackish markings on the back. You will notice that the part immediately behind the head is considerably thicker and more wrinkled than the rest of the body. This is the part that carries the three pairs of true legs, which are thin, horny and pointed. Further back, you will see five pairs of stouter fleshy legs called the claspers. They use these clasping legs for holding on to the branches of the tree, while the small pointed legs in front are used more like hands. Just above the end of the body is a short fleshy tail or horn. If you look carefully, you will see that the body is divided up into joints. There are thirteen of these, counting the head as the first joint. Look still more closely on the sides of the body, and you will find, on each side,

a row of tiny black rings, one on each joint of the body. You will find it difficult to guess what these are for. They mark a corresponding number of tiny openings into the body, through which the caterpillar breathes. Insects do not breathe through their mouths, but through separate openings, usually on the sides of the body, as in this caterpillar.

As the silkworm grows larger, it will of course require more food, but it will now be able to eat the older and coarser leaves of the mulberry. When they are quite small, a large number of the worms may be kept on a single tray, but as they grow, they will want more room, and must be separated and put on to fresh trays. A convenient way to keep them is to make a framework, with several shelves, on the plan of the above sketch.* Thin bamboos or any straight jungle sticks will do for the posts, and the shelves may be made of split pieces of bamboo laid close together. The paper trays can be placed on these shelves.

The posts of the frame must stand in tins containing water with a little kerosine floating on it. This will prevent the ants from climbing up and eating the caterpillars.

When the silkworms have grown to their full size, which will be in about five weeks' time, they will stop feeding and begin to spin the wonderful silken cases in which they hide themselves for a time before appearing as moths. These cases are called cocoons. You must now hang some bunches of fine twigs above the trays, in such a position that the silkworms can climb up into them and spin their cocoons there. Now, watch one of the caterpillars after it has climbed on to the twigs. You will see it twisting its head about and fastening fine threads of white or pale yellow silk to the twigs all round about it. If you look very closely, you will see the silken thread coming out of a small pointed knob just below the head of the caterpillar. It goes on spinning more and more silk all round itself, until it is quite hidden. And it will go on spinning, inside this covering, long after you have lost sight of it, until it has formed a stout egg-shaped case for itself. The cocoons are quite soft at first, so you must be careful not to touch them for at least a week after they have begun to spin. After that time you may take one of the cocoons and examine it. You will find that the outer part is loose and fluffy. If you pull off the outer part, you will see inside the egg-shaped case that I have told you about. It is very tough. You could not tear it open with your fingers. But it is made of just the same fine silk that you have seen on the outside; only the caterpillar has stuck it together with a kind of gum. Take a pair of finely-pointed scissors and cut open one side of the cocoon. See how soft and smooth the inside of the case is. If only a few days have passed since the cocoon was commenced, you will find the caterpillar still inside it, but very much changed in appearance—quite shrunken and shrivelled. You will hardly recognize it. If you cut open another cocoon later on, instead of the shrivelled caterpillar, you will find a plump, smooth, dark brown object which is called a chrysalis; and just behind it you will see the empty skin of the caterpillar. The skin has been shed, just as on previous occasions, only instead of a caterpillar with a new coat appearing beneath it, this shiny brown chrysalis has taken its place. The chrysalis cannot walk about. It can only wriggle. It has no legs. Nor does it eat anything in this stage. Look at it closely, and notice the marks on it. They faintly show the wings and legs of the coming moth.

* Not reproduced.

Nothing more will happen for about a fortnight. Then, some morning, you may be surprised to see a creamy white moth hanging on to the outside of its cocoon. At the end of the cocoon is a large hole through which the moth has come out. If you can find it immediately after it has come out, you will notice that its wings are quite small. Watch it for about half an hour, and you will see these little pad-like wings steadily growing and spreading out until they have reached their full size. Notice the shape of the moth. It has a small head with two large blackish eyes and a pair of feathered horns or feelers. There are four wings, the front pair with a curved point at the tip, the hind pair rounded. The moth has only six legs, and these legs have been developed from the small horny legs that you saw just behind the head of the caterpillar.

When several moths have appeared, some of them will commence pairing. The pairs should be placed on fresh sheets of paper on the trays. The females will lay their eggs on the paper, and these eggs must be kept to raise new broods of caterpillars. They will not hatch out for several months. When first laid, the eggs are of a pale yellow colour. They gradually darken, until, in two or three days' time, they are slaty gray.

We have now watched the whole life of the silk worm insect from the egg to the moth. But if we want to use the cocoons for making silk, we must not allow the moths to come out. The pierced cocoons are of no use for spinning, though "floss silk" can be made from them. If, then, the cocoons are to be used for spinning, they must be taken, about eight days after they have been formed, and either baked or thoroughly dried in the sun. They may then be packed and sold to the manufactory, where they are converted into spun silk.

Though you will have nothing to do with the further treatment of the cocoons, it may interest you to know what will happen to them.

The first process is known as "reeling." The cocoons are placed in boiling water for a few minutes to soften the gummy matter that binds the fibres together. The loose outer silk is removed, and the ends of the silk fibre are found by brushing the cocoons with a bunch of fine twigs or stiff brush. The fibres of four or five cocoons are then lightly twisted together and attached to what is called the "reeling machine," which gradually winds off the silk from the whole cocoon. As one cocoon is exhausted, the fibre from another one is attached in its place. These four or five fibres from the several cocoons adhere together

and form a single rounded thread which is still, however, much too fine and delicate for use, and several of these threads have to be twisted and spuntogether to form a thicker thread. These are what are used in weaving and from which all the gay-coloured cloths that you know so well are manufactured. The actual weaving is too complicated a process to be described here, but perhaps some of you may have seen native cotton cloths being woven. Silk cloths can be woven in just the same manner.

E. ERNEST GREEN,
Government Entomologist.

September, 1902.

INDIAN PLOUGHS AND WATER LIFTS.

There are many of our readers who will be glad to know what farm implements and machines can be cheaply procured from the neighbouring continent where they have been found useful. The following extract from a review of Prof. Mukerji's work on Indian Agriculture by the *Indian Agriculturist* gives the views of that experienced officer on the subject:—

Among different forms of improved plough preference is given to the Meston, which has recently been invented by the Agricultural Department of the North-Western Provinces, and the price of which is only Rs. 4. It is said, however, to be useless for heavy soils. Of other varieties, we are told: "The Watt's Plough, also N.-W.P. Agricultural Department plough, is stronger and more efficient, but its price is Rs. 7. The Shibpur plough is rather too heavy for ordinary Bengal bullocks, and its price is Rs. 7'8. Both Watt's plough and Sibpur plough can be used for ploughing heavy soils. Jessop & Co.'s 'Hindustani Plough,' 'Seeley's S. S. Plough,' the 'Kaiser Plough,' and the 'Baldeo Plough' of the N.-W. P. Agricultural Department, are other improved ploughs that may be mentioned here. The Baldeo plough, which has also a mould-board like the other improved ploughs, has been actually sold for Rs. 3 each, but it is too light and inefficient, and it is altogether unsuitable for heavy classes of soil. Of the ploughs tried at the Sibpur Farm, the soil of which is very heavy, the Sibpur plough has been found the most effective. It does a little over one-third of an acre a day (8 hours) at the first ploughing, and a little over half an acre a day at the subsequent ploughings. The bullocks should be at least high-class Bengal bullocks. The comparative efficiency of the different forms of water-lift in use is exhaustively discussed, and the following are the conclusions arrived at: "(1) The Don is the best implement for Indian use for small depths (up to 6 ft.), its lifting capacity being 10,000 gallons per hour. (2) Next to it comes the swing basket, which, in the hands of dexterous coolies, will lift about 2,000 gallons of water per hour from a depth of 10 ft. (3) For medium depths, either a double or triple series of Dons, or the lever and bucket lift *tera*, is the best, 500 gallons of water can be raised per hour with *tera*. (4) For great depths, the single and double *mot* and the Egyptian or Punjab pattern Persian wheel are the best. The *mots* will gave about 1,000 gallons per hour, and the Persian wheel about 500 gallons. Considering the cost, the single *mot* is to be preferred to all others for great depths, and to adapt ordinary ring wells of only 3 ft. diameter, and to avoid spilling of water, the bucket can be made to slide up two steel ropes stretched vertically from the bottom of the well up to the beam whence the pulley is suspended."

FERTILIZING BANANAS.

Experimenting on a banana plantation under irrigation, and where bananas have been grown for 12 years, sulphate of ammonia applied alone very quickly gave an impetus to vegetative vigour; the tree grew very large, but produced bunches of very disappointing size relative to the huge plant. On another piece basic slag was applied; this fertiliser is rich in phosphate and lime, the trees were not forced to huge growth as with the sulphate of ammonia, but the bunches produced were very good and well repaid the cost of fertilizing. The bunches were about equal with both fertilizers, but the trees with sulphate of ammonia were the best looking. However, as the basic slag only cost £4 10*s*. a ton and the sulphate of ammonia cost £15 a ton, the best net return was of course with the slag. An application of lime alone did not show any results where two tons and a half were applied per acre, but where five tons were applied the trees at once responded, the stems were stouter than on the rest of the plantation, and seemed very firm with very strong roots, and the fruit was much improved. Further experiments will probably be carried through with simple fertilizers like bonemeal, which contains an appreciable amount of nitrogen, and is especially rich in phosphates; and with cocoanut meal from the Oil Factory, which contains nitrogen, phosphate and potash, but is richest in the first named. Then complete commercial fertilizers may be tried, that is, compounds of the different elements containing nitrogen, phosphoric acid and potash, calculated on the needs of the plants, and the soil as indicated by the first simple experiments with single fertilizers. To get the maximum of crops the soil must be perfectly adapted to the needs of the plant, and the experiments are being carried through at some expense in the hope that a combination will be hit upon that will cause the fields to yield fruit quicker and of a higher grade when, as in the case with fruit-growers generally in other lands, the result may give a good return on the outlay for fertilizing. The soil being already fairly rich in potash as shown by chemical analysis, no experiments have included potash, but in the great majority of soils every fertilizer for fruit trees should be strong in potash.—*Jamaica Agricultural Society.*

THE VALUE OF MANIOC AS FOOD.

In view no doubt of the attention being given (in America as well as in India) to Manioc or Cassava as a food, a useful paper dealing with the nutritive value of the article as such appears in the January number of the *Queensland Agricultural Journal*, from which the information given below is gathered :—

It is generally understood that there are two distinct varieties of manioc, viz., the sweet (*Manihot aipii*) and the bitter (*M. utilissima*), but the difference is believed by many to be induced by the character of the soil.

The so-called sweet cassava is largely grown for human and cattle food, and the starch from it is the source of commercial tapioca. This starch, which is its chief constituent is found to the extent of from 60 to 70 per cent, the Nitrogen from 1 to $\frac{1}{2}$, and proteids from $7\frac{1}{2}$ to $3\frac{1}{2}$ per cent, that is in the dry materials; the higher the percentage of starch, the lower that of nitrogen and proteids; so that the richer the soil, the more nitrogenous matter and less starch. In comparison with wheat and even Indian corn, cassava is inferior owing to the low proportion of proteids.

The most serious point, however, in connection with the use of manioc as a food is the presence of Hydrocyanic or Prussic acid, which, though equally present in all forms, is in the sweet cassava located chiefly in the outer skin and rind. This poison, which makes the root dangerous for food in the natural state, can fortunately be completely eliminated by thorough boiling and after washing, and it is advised that this treatment should be carried out in the preparation of any form of human or cattle food made from it.

According to Dr. Wiley, the well-known American chemist, the amount of Hydrocyanic acid in the roots is relative to the amount of nitrogen contained in them, and as this element varies according to the nature of the soil, the poorer the soil, the less nitrogen and less poison.

It has been found by chemical examination that the dangerous element is on an average found to the extent of 2·04 grains per lb. in the fresh, and 5·39 grains per lb. in the dry material, so that a horse would only need to consume 3 lbs. of the dry or 8 lbs. of the green root, and a man 3 oz. of dry and 8 oz. of fresh material for a fatal dose. So that in the natural state manioc must be consistently avoided.

BY HIGHWAYS AND HEDGES.

It is not, I think, generally known that among native plants we have two species of vanilla, viz., *V. Walkeriæ* and *V. Moonii*. I fancy it is the latter that I have seen between Dandugamuwa and Pannala in the N. W. Province, near Kankaniyamulle, where a resourceful local resident has cured the beans after his own fashion for flavouring his favourite liquor !

A notable specimen of *Pithecolobium saman*, the "rain tree," is the one in the Bilhul Oya Resthouse compound, no doubt one of the first plants put down when the tree was introduced into the Island. It is an enormous specimen, and is said to have been planted by some G. A. or A. G. A. of the olden time.

In some villages, as in the Kalutara district, one sees exposed for sale on the way-side fairly large-sized catkins of what is locally called wel-mal, Siribo, and Ratabulat-wel, botanically known as *Piper Siriboa* (a variety *P. Betle*). These catkins are used for chewing with betel and its concommitants, in order to impart a pungency to them, just as the root of *Kaempferia galanga* (Sin. Hinguru-piyali), the flower buds of *Alpinia nutans* (Rankiriya), and the seeds of the cardamom are used.

When cutting up the yam called ratala, a bright red dye may be seen just beneath the outer cuticle, imparting to the yam itself, on its outside surface, a purplish tinge somewhat like that of the well-known "Jaffna yam." This dye is readily extracted by metyllated spirits, and on evaporation leaves a sediment. So that it is possible to use the dye for colouring food in place of cochineal, which I have known people object to, owing to its animal origin.

Memecylon umbellutum, called in Sinhalese korakaha, is well known as a source of a yellow dye got from its leaves, but I was not aware till lately that the beautiful bosses of bright blue flowers which make this tree so conspicuous an object amid forest flora, are made to yield a blue colouring matter used in Sinhalese paintings.

A very handsome tree is mas-mora (*Adenanthera bicolor*) next door neighbour to the well-known and common madatiya with its bright red seeds, a favourite plaything with children from its resemblance to red coral, and used also by gold and silversmiths as weights of about 4 grains each. (Roasted madatiya sometimes hawked about for sale is a thing to be avoided owing to its extreme indigestibility). The young foliage of mas-mora, which is coloured pink, is a pretty element in forest vegetation. The tree is common near Matugama.

In the neighbourhood of Pelmadulla and Rakwana are to be found some of the largest specimens of the *Entada Scandens* (puswel) with its huge polished leathery seeds brought down by streams (along which the climber is generally found) into the sea and cast up on the beach, where it is picked up and used as a toy. This seed (called "Batang" in Sinhalese) is a good instance of seeds designed by nature to retain their vitality, in spite of long immersion while being transported through the agency of water. I have a specimen of the bean 50 in. long gathered near Welandura.

The leaves of a plant of the Caper family known as Wéla (*Gynandropsis pentaphylla*) emit a strong and by no means pleasant odour,

Though put down as a common weed by Trimen, it is not very frequently met with, and is sometimes searched for in the neighbourhood of Colombo for its medicinal properties, being highly esteemed as a remedy for flatulency. It is generally grown by Tamils near their dwellings. A strange method of employing it as a remedy for hydrocele is said to be by tying a poultice made of the leaves round the upper arm! The leaves are also cooked and eaten.

It is not often one hears of flowers being used for food. The most common instance is that of *Sesbania* (Agati) *grandiflora*, known in Sinhalese as Katuru-murunga, the flowers of which fried in butter with seasoned batter is a tasty vegetable dish. Another flower or rather flower bud, used as food in the villages is *Careya Arborea* (Kahata) also known as the "Patana oak" which yields fibre and tanning bark. I have seen the buds being collected for food along the canal road to Chilaw near Walahapitiya.

DISEASES INCIDENTAL TO PREGNANCY AND PARTURITION.

(A. M. CREIGNTON, M.R.C.V.S.)

Concluded.

METRITIS AND METRO-PERITONITIS.

Definition.—Inflammation of uterus, inflammation of uterus and peritoneum. I shall consider these diseases under two heads—(1.) Simple metritis is the simple inflammation of the organ; (2.) Septic metritis inflammatory action due to the presence of a bacillus in the uterus and in the discharges therefrom.

Causes.—Unskilful and rough usage at calving, injuries, colds, draughts, retention of placental membranes, external violence, septic infection.

Symptoms.—Usually ushered in with rigors, pain on pressure over region of womb. Tumefaction of the vulva, with heat and dryness; then follows a discharge of purulent offensive matter from the vulva, increase of temperature, quick small pulse, increased respirations, grinding of the teeth, secretion of milk suspended, bowels constipated; on passing fæces animal evinces pain: on examination per vaginam, os uteri will be found hot and sensitive; sometimes discoloration is seen on examination per vaginam.

Treatment.—Explore vagina if possible and ascertain if fœtal membranes are away; there may be some shreds left which may be putrefying in the womb. If so, wash out with a reliable disinfectant and antiseptic, give a mild laxative with anodynes, and apply hot water blankets round the abdomen, and see to the general comfort of the animal. If we fear the metritis is of a septic origin, try the administration of internal antiseptics and stimulants with nutritious diet, and thorough irrigation of the uterus and vagina every day at least with suitable antiseptic solution. Some recommend packing the womb, but I have never resorted to this in cattle practice.

POLYPUS IN THE VAGINA.

These are frequent in the cow, attached to the mucous membrane a little distant from the orifice; the shape is generally that of a pear. I removed one weighing 4½ lbs. from the vagina of a cow lately by ligature and excision, and used a simple antiseptic dressing for a few days; the cow did all right.

PARTURITION.

Now, gentlemen, I just wish to say a few words in regard to parturition in the cow. As a rule the messenger that comes for us in these cases is sweating and out of breath, and will gasp out that Mr.' So-and-so wants you to come to a cow that cant calve. After asking a few questions we pack up a few necessary instruments, ropes, and the usual paraphernalia, and proceed with all speed to the scene of action. When we arrive there, and begin to explore the case, we generally find that Mr. Handyman has been there before us, and has spoiled the case and left it, because he could not do it. There are just a few positions that I wish to say a few words about. (1.) Breech presentation. (2.) One fore and one hind limb. (3.) Two fore limbs with head away back. (4.) Twist of neck of womb.

In breech presentation, push back buttocks of calf right as far up and back as you can, then get hold of foot and turn sideways and upwards, and you will get it into passage quite easily. Do likewise with other foot and the calf generally comes away quite easily.

If one fore and one hind you require to be able to judge which way the fœtus will come away easiest. Generally to push back the fore limb is safe practice, as by doing so you have no trouble to look for the head. Then get up the other hind limb and the fœtus comes away with little trouble.

In the case with the two fore legs with the head back, the position is generally the result of long-continued straining of the cow without delivery. If the head cannot be searched by the hand try a blunt hook, and if unsuccessful then try and remove one fore limb, which is sometimes a very difficult job. You should then be able to reach head and get fœtus away. Then as regards twist or torsion of the womb, this generally involves the cow to be thrown and rotated from one side to the other until the twist is undone, and then delivery is usually easily enough accomplished. Some veterinary surgeons recommend jamming fœtus in passages and take it away that way. After-treatment is anodynes if necessary and fomentations if needful.

PARTURIENT APOPLEXY.

This disease used to be very fatal in the cow until Herr Schmidt, of Kolding, found out the pot. iod. treatment. There are a good many theories put forward as to the cause, such as clean milking immediately after calving; by ptomaines, the products of decomposition of food in the stomachs and intestines (but I look upon this as the result, not the cause of the disease); by anæmia of the brain; and by auto-intoxication. I favour this view and believe milk fever is due to some toxic material that gains entrance or is manufactured in the animal economy and thus gaining access to the blood-stream. It may be due to some bacillus, but for that I can't say. By some it is supposed to arise from the liver not

being able to cope with the waste products in the blood during the time of rapidly rising lactation, especially as the liver and in fact all the glands in the animal economy have been in a state of comparative quiescence during the dry period—the light food the animal gets when dry is suddenly altered to stimulating food—and this condition may give rise to the auto-intoxication that produces the symptoms that we all so well know, and the eight principal symptoms have been put before you when contrasting them with puerperal eclampsia, so I will go on to the treatment and sequelæ. This much then can be said of milk fever, that it may be considered a genuine auto-intoxication caused by the accumalation or manufactue in the system of toxic material during the first stages of lactation. This circulating through the blood causes the symptoms of poisoning of the whole system of the animal. In relation to this theory I would point out that only good milkers are attacked, and that those which have been dry for some time are more liable, especially those that have been fed on rich food when dry, and cows that are hardly ever outside the byre. These sort of cattle, after an easy calving, go at the milking in a hurry (as we may say), and arrive at the height of lactation very quickly, and in this way the intoxication occurs, owing to the overburdening of the liver and kidneys with work. Just as when the air we breathe is polluted with a certain amount of Co2 we show the effects of Co2 poisoning, so, when the toxic material gets to a certain percentage in the blood of the cow she shows the symptoms of poisoning. Of the percentage that it takes I can't say, but this is the theory I hold in regard to milk fever, and upon this I base my treatment, and whether it is a product of casein, neuclein, albumen, or what, I am not prepared to say. Clearly it is the province of our scientists to elucidate such problems, for the general practitioners have neither time, money, nor appliances to do so.

Treatment.—I have tried a lot of remedies in milk fever; I have tried the following injections into the udder and they have proved fairly efficacious.

℞ Chinosol from 40 to 60 grs., according to size and weight of cow; boiled water 2 quarts.

And after milking the cow, clean and disinfect the udder and teats, when about the blood-heat I inject one-fourth into each teat. I also give the following every three hours alternately if the cow can swallow, and if in a weak state I give 4 oz. spt. ammon. arom. in 1 pint cold water, and if she can't I inject with the stomach pump.

℞ Liq. ammon. acet. conc. (1 in 7) ʒii.
Spt. ether nitrosa ℥ii.
Aqua ℥xii.
Then ℞ Whisky ℥iij., or spt ammon. arom. ℥iij.
Aqua ℥xii.

I sometimes use the following injection, which is also very good:

℞ Iodine resub. grs. iv.
Pot. iodide 4 to 5 drs.
Boiled water 2 qts.

To be used as the foregoing. The drenching part of the treatment must be done with great care.

The sequelæ are: mechanical bronchitis from regurgitation of the food, mammitis, metro-peritonitis, from giving drastic purgatives; pneumonia, bruised knees and hocks, fatty degeneration of the muscles of the thighs from bruises, paralysis, choking at drenching. If a cow has tuberculosis in a latent form and takes milk fever she is sure to die. I sometimes empty rectum and bladder, and this sometimes gives the animal relief; I also sheet up the animal well, as there is a tendency to a sub-normal temperature. I have tried stimulating embrocations along the spine when the cow was long in getting up, and when symptoms of paralysis are shown I prescribe doses of nux vomica. A great deal of success lies in the manner in which the cow is nursed. I give the attendants orders to turn the animal every four hours or so, but sometimes they neglect to do this very necessary part of the treatment, with the result that the cows get knees, hocks, &c. bruised, and then when she wants to rise she can't because of the sores and bruised condition of the muscles. There has been more success in the treatment of this disease in late years than before.

Now, gentleman, I think I have taken up your time sufficiently, and I will come to a conclusion by saying that the lot of a country veterinary surgeon has its bright side as well as its dark side. He generally gets his clothes more soiled and is generally not so stylishly got up as his city brother; we have as a rule more dirty work and smaller pay for it, and we must appear in harmony with our work.

I beg to thank you all for your patient hearing, and I trust that my effort will be rewarded by the members all participating in a good discussion.

GENERAL ITEMS.

The following descriptions of methods by which bones may be more or less readily reduced to powder without the aid of a crushing mill deserve quotation: "A simple plan is to pack the bones, layer by layer, with freshly calcined wood ashes in a barrel and keep the mixture moistened for some months. * * * * A quicker method is to boil the bones in an iron or copper boiler with strong caustic lye. The proportion of bones and lye to be used is roughly 15 parts by weight of bones to 5 parts by weight of caustic soda, or 7 parts by weight of caustic potash, dissolved in 15 parts by weight of water. The boiling should be done for two or three hours. But even without boiling, the bones will become disintegrated by being simply kept in the caustic liquor for about a week. Another method of softening bones is by mixing them in heaps with quicklime and loam. A layer of loam 4″ deep is first spread, and on this is put a layer of bones 6″ deep, and above this a layer of quicklime 3″ deep. The layers of loam, bones, and quicklime are repeated until the heap reaches a convenient height, when it is covered all over with a thick layer of earth. Holes are then bored in the heap from the top and water poured down them to slake the lime. The mass will become hot and remain so for two or three months, after which the bones will become friable, and the whole heap may then be mixed up and spread as manure on land."

It is stated that the Government of India have finally decided to organise the proposed Commercial Bureau from the next official year. The Bureau will be independent of all semi-official intelligence bureaus and other agencies which carry on business in commercial intelligence.

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Cape Colony has followed the example of Australia in restricting the immigration of Asiatics. The test imposed—that of ability to write English,—will have the effect of excluding a large porportion of Indian traders. Unlike Natal, Cape Colony is not one of the territories to which coolies proceed, so that the newly-imposed rule is not expected to affect the labour market.

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From an external source we learn that a syndicate of planters in the Kelani Valley have concluded negotiations for the purchase of 600 acres of land for the cultivation of para rubber at Bulat Kohupitiya, not far distant from Ruanwela, in the Three Korales of the Kegalle district.

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According to the general memorandum on the grount nut crop in Bombay and Madras, 1902-03, we learn that in Bombay the total area, according to the latest reports, has risen from 39,500 acres in October to 46,650 in November, but is still less than half of last year's area and of the average, the decrease being due to deficiency of rain. In Madras, where the crop is grownin only nine districts to any appreciable extent, the total area at the end of December was 421,900 acres. This is a considerable increase on the cultivated area of recent years.

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The latest addition to periodical agricultural literature is the "Transvaal Agricultural Journal," published under the direction of the Transvaal Government, and edited by Mr. A. R. E. Burton. The journal is for the present issued quarterly.

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Mr. Gerard, the well-known chemist and chief of the Paris Municipal Laboratory, pronounces citric acid a prophylactic against cholera. He experimented on the bacillus of both cholera and typhoid fever, and found that in the acid the microbes cannot live. The same competent authority says that 15 grains of citric acid added to a quart of tainted water will effectually destroy all germs of microbes. With this view of the beneficial effects of lemon juice he recommends the drinking of lemonade during the prevalence of any disease or during epidemic. Citric acid is believed to owe its great virtue to its strong affinity for and solvent powers over urea, with which it unites to form a soluble salt. Uric acid is the bane of civilized man, and to this chemical body in some form or other we are most indebted for our various forms of rheumatism, gout, neuralgia, and kindred diseases.—*Agricultural Journal*, Natal.

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Here is a new method of planting tomato seedlings:—Make a case of stiff paper with a small hole at the apex. Pass the root of the plant outward through the hole, the stem remaining within the case. Some earth is put round the stem and the plant thus removed is put in the hole in the soil, so that the rim of the case is an inch or two above the surface. The case protects the plant for cut worms and prevents the drying of the earth around it.

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When sweet potato and other leaves are attacked by red spider, use kerosene emulsion or dust with a mixture of lime four parts and flowers of sulphur one part. Either will prove successful if used at the commencement of the attack.

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A simple home-made liniment says the *Australian Farm and Home*, that is almost magical in effect is composed of kerosene, camphor gum and sweet oil. Into a quart bottle put one pint kerosene, and add as much camphor gum as will disslove, add a little more day by day, shaking thoroughly. Now add half pint sweet oil and shake well, and the liniment is ready for use. Cork well and keep away from children. It is excellent for cuts, burns, bruises, slipperies, sore throat, &c.